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PROCEEDINGS

OF THE

ROYAL GEOGRAPHICAL SOCIETY

AND

MONTHLY RECORD OF GEOGRAPHY.

PUBLISHED UNDER THE AUTHORITY OF THE COUNCIL, AND EDITED BY
THE ASSISTANT SECRETARY, 1, SAVILE ROW.

NEW MONTHLY SERIES.

VOL. II., 1880.

STANFORD LIBRARY

LONDON:
EDWARD STANFORD, 55, CHARING CROSS.
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PROCEEDINGS

OF THE

ROYAL GEOGRAPHICAL SOCIETY

AND MONTHLY RECORD OF GEOGRAPHY.

The Arctic Campaign of 1879 *in the Barents Sea.*

By Captain A. H. MARKHAM, R.N.

(Read at the Evening Meeting, November 24th, 1879.)

Maps, p. 80.

THE year 1879 must always be regarded as a very remarkable one in the annals of Arctic exploration, for during the last few months two important geographical problems have been successfully solved.

We have, in the first place, the Swedish ship *Vega*, under the leadership of that persevering and energetic explorer Nordenskiöld, completing her voyage from the Atlantic to the Pacific, by rounding the northern termination of the old world—a voyage which, even if it should not prove important in a commercial sense, will always rank as one of the greatest geographical feats of the present century. And, secondly, we have a small sailing schooner reaching the hitherto inaccessible shores of Franz-Josef Land. I say inaccessible, because it must be remembered that the *Tegetthoff*, the only vessel that had ever approached this coast, had been carried thither by the ice in which she had been helplessly beset for two years, an imprisonment from which her officers were never able to extricate her. The vessel that has so successfully accomplished the second feat is the little Dutch exploring schooner *Willem Barents*, an account of whose cruise, undertaken during the preceding year, was communicated to our Society by Mr. Clements Markham in December 1878.

Three hundred years ago the Dutch flag was a formidable rival to our own in the van of Arctic discovery, and I am confident that English geographers will be delighted to hear that Holland has again entered the lists, and has already scored a great success.

The importance of this achievement cannot be too highly rated, for it tides over the only difficulty which, in the opinions of a great many

Arctic authorities, presented itself with regard to the selection of a route for future exploration. At the same time it entirely corroborates the views that I have held since my return with Sir George Nares, and which I had the honour to announce publicly in this hall some months ago, during a discussion which took place on that interesting subject. The great obstacle to success that seemed then to present itself, was a strip of ice-covered sea, some 60 miles in breadth, that was supposed to exist immediately to the southward of Franz-Josef Land, the penetration of which would offer so many difficulties as almost to be regarded as insuperable. Now, we hear that this impediment is not a permanent one, and is, indeed, in some seasons, altogether removed, for the *Willem Barents* actually sailed from Cape Nassau in Novaya Zemlya, to within a few miles of M'Clintock Island, in Franz-Josef Land, without, as the saying is, "touching a piece of ice!"

By a brief reference to what has already been accomplished in the Novaya Zemlya waters, I hope to be able to prove satisfactorily this evening, that the past summer, during which the *Willem Barents* made her memorable trip, was not an exceptionally favourable one, and that the only other time that Franz-Josef Land has been approached, namely, in 1872–3, when the *Tegetthoff* was drifted thither, was a remarkably unfavourable ice year.

Since the return of Sir George Nares' Expedition in 1876, England has been content to look on whilst our foreign friends have been energetically and successfully prosecuting the work in which we cannot but feel that this country ought to continue to take a leading part. Although our geographical knowledge of the unknown region has not been greatly increased, yet the observations that have been made regarding the conditions and locality of the ice, and other important investigations connected with physical geography, will prove of the greatest value, more especially when regarded with a view to further Polar exploration.

My own cruise, this year, although undertaken in only a little sailing cutter of 43 tons burden, was, as far as it went, perfectly successful, and has tended very materially to strengthen my preconceived opinion that the route by Franz-Josef Land is the one that will lead to the discovery of the greatest amount of previously unknown country.

It is time for this Society again to take a leading part in arousing the British public from the apathy they appear to have fallen into, and to excite in them a friendly rivalry by pointing out the successes of other nations in that field in which England has already scored so many glorious successes.

I propose, before referring to the proceedings of the present year, to submit a rapid sketch of previous work in the direction of Novaya Zemlya. The two islands, generally known as constituting Novaya Zemlya, are situated between the 70th and 77th parallels of north latitude, and between the 51st and 69th meridians of east longitude. They lie in a N.N.E. and S.S.W. direction, bending towards the east at either extreme. They are nearly 400 geographical miles in length, with an average breadth of about 50 miles. The northern island is the larger of the two, and is separated from the southern by a narrow channel, in some places not more than a mile broad, and about 60 miles in length, called the Matyushin (Matotschkin) Shar.

This remarkable strait is bounded on either side by high hills, and, in some places, steep precipitous cliffs. The former are noble *fjelds* towering, in majestic solemnity, to an altitude of from 3000 to 4000 feet above the level of the sea. The channel is excessively deep, as much as 80 and 90 fathoms being found in the centre, but there are good anchoring places for small vessels close to the shore.

So sharp are the windings in the Matyushin Shar that vessels have frequently been known to sail some 10 or 15 miles into the strait, when, seeing land close ahead, with, apparently, no outlet to the right or left, the captains have concluded that they were running into some land-locked bay, and consequently sailed out again, to look for the entrance of the channel they were actually in. A great deal has been said by former navigators of the difficulty experienced in finding the western entrance to the Matyushin Shar, but this difficulty can only have occurred to those who visited the channel for the first time, for the entrance is marked by such conspicuous and prominent hills and headlands that no man with any pretensions to being a sailor, who had once visited the strait, could be deceived regarding the identity of its entrance. A number of rocks, the majority above water, fringe either side of the channel at the western end, necessitating caution on the part of those desirous of entering, but once fairly inside the strait the shore may be approached on either side with impunity.

When, and by whom, Novaya Zemlya was first discovered, are questions difficult of a satisfactory solution. The name itself, signifying New-land, implies that the first discoverers were Russians.

Nearly all the old navigators of whose deeds we possess records, mention having met Russians along the coast who were employed hunting for furs and oil. Although English names are conspicuous by their absence from the charts of Novaya Zemlya, yet the first authenticated record of its discovery is, undoubtedly, that of Sir Hugh Willoughby, who sighted the western coast in latitude 72°; thence sailing to the northward for three days, presumably in sight of land, and finally to the south. This was in the year 1553. The extreme northern position reached by this navigator is unknown. The tragic fate of the expedition is a matter of history.

Sir Hugh, with his two vessels, the *Esperanza* and the *Confidentia*, put into a bay on the Lapland coast, merely for the purpose of awaiting a favourable change in the weather, but shortly after their arrival a severe winter set in, and the ships were frozen up. Parties were at once despatched, who made journeys of three and four days' duration, in search of inhabitants, but they all returned unsuccessful. The ships were ill provided with the necessaries for guarding against the rigours of an Arctic winter, the hardships of which were, in those days, little understood by our countrymen, so that it is hardly surprising to hear of the appalling fact that Sir Hugh Willoughby with the entire crews of both vessels, numbering sixty-five souls, perished from the combined effects of cold and starvation. The following year the two ships, with their ghastly crews of stiffened corpses, were discovered by some fishermen. From a signature of Sir Hugh Willoughby it was ascertained that he, at any rate, was alive towards the end of January, 1554, but in all probability the majority of his companions perished at an earlier date.

There is little doubt regarding the exact locality where this tragical catastrophe occurred. The bay in which the vessels took shelter is situated on the coast of Lapland, to the westward of the island of Norkuieff, near the Arzina (Varsina) River. The authority for this is Mr. Anthony Jenkinson, captain of the ship *Primrose*, who visited the spot in the year 1557, four years after the melancholy event. In his journal he thus alludes to it:—"July 6th. We passed by the place where Sir Hugh Willoughby, with all his company, perished, which is called Arzina-reca, that is to say, the River Arzina." The place was pointed out to Jenkinson by one Robert Best, who, two years previously, had been at the mouth of the River Dwina, when Willoughby's two ships were brought round.

Sir Hugh Willoughby's expedition had originally consisted of three ships, but one of them, commanded by Richard Chancellor, had parted company from the others off the North Cape on their outward voyage, and thus escaped the like fate.

Sir Hugh Willoughby's chief qualifications (for he was no sailor) for being selected as commander of this expedition were, firstly, "by reason of his goodly personage, for he was of tall stature," and secondly, "for his singular skill in the service of war." These would, at the present time, be considered singular qualifications for the leader of an Arctic expedition!

The next to sight Novaya Zemlya was Stephen Burrough, who had served as pilot or master of Chancellor's ship in the afore-mentioned expedition. He sailed from England in the spring of 1556, in a little pinnace called the *Serchthrift*, for the purpose of finding a north-east passage to China. Sailing along the coast of Lapland, he discovered the strait leading into the Kara Sea, which separates Novaya Zemlya from Waaigat Island, but being prevented from proceeding further by "the great and terrible abundance of ice," and by persistent head winds, he sailed into the White Sea, and wintered at Archangel, returning to England the following year. This strait has subsequently borne the name of its discoverer, although it is as often called the Kara Strait or Gate.

Oliver Brunel, a Dutchman, appears to have been the next to visit the shores of Novaya Zemlya, for, during a journey he made through the Samoyede country to Siberia, he was conveyed by sea along the coast to the mouth of the Obi River, and thence was taken by a Russian pilot through the Kostin Shar, a channel on the south-west coast of Novaya Zemlya, separating that land from a large island called Mesdusharsky.

It is generally supposed that, during one of his numerous expeditions, Brunel was taken through the Matyushin Shar. Should this supposition be correct, he is, without doubt, the first *civilized* European who ever sighted the northern island of Novaya Zemlya, but no authentic proofs exist to substantiate such a supposition. The exact date of Brunel's expedition alluded to above is unknown, but it was prior to the year 1580, and in all probability about 1571 or 1572.

Pet and Jackman in 1580 followed in the footsteps of Burrough, but did little more than discover the strait separating Waaigat Island from the mainland, since called Pet, and sometimes Jugor Strait. They penetrated a short distance into the Kara Sea, but finding the ice heavy and tightly packed, and being withal severely handled by it, they were compelled to relinquish further idea of making the north-east passage, and steered in a homeward direction. The two ships parted company in a dense fog on the 22nd of August, the *George*, with Captain Pet, reached England in safety the same year, but Jackman's ship, the *William*, was never again heard of. Although it has been generally supposed that Jackman succeeded in reaching some Norwegian port in which he wintered, and sailed the next year bent on further discoveries in a north-westerly direction; it is, I think, more than likely that he passed the winter at Kolguiev Island, or else in some bay on the coast of Lapland, whence he sallied forth the following year to prosecute his researches to the north-east. This idea is formed in a measure from the following notes, published by Purchas, of one Antony Marsh, who was a chief factor of the newly formed Muscovy Company. He derived the information from Russian sources. He writes:—"Heretofore your people (that is the English) have been at the said river of Ob's mouth with a ship, and there was made shipwracke, and your people were slaine by the Samoeds, which thought that they came to rob and subdue them." This was written in 1584, and Jackman was lost in 1580. As no other English ships were trading, and lost, during those years in that particular locality, it seems reasonable to conclude that the vessel and people here alluded to could be no other than the *William* and her crew.

Following closely on the heels of Pet and Jackman, we again find Oliver Brunel navigating the Novaya Zemlya seas, and this time in command of the first real Dutch Arctic Expedition that had ever been despatched from the shores of Holland. The expense of this enterprise was in all probability partially defrayed by the liberality of the well-known merchant, Balthazar de Moucheron. It resulted, however, in total failure. Brunel attempted, but in vain, to pass through Pet Strait; the ice was of such a nature as to effectually defy all efforts made to penetrate it, and Brunel was eventually shipwrecked on his return voyage.

Barents, the famous Dutch navigator, in 1594 was the next to visit Novaya Zemlya, and to him, I think, must be accorded the honour of being the discoverer of the north island, at the north-eastern extremity of which he subsequently (in 1596–7) passed a winter.

On some of the English charts this island bears the name of Admiral Lutke, the distinguished Russian naval officer who was employed sixty years ago in surveying the coasts of both islands. In my opinion, it would be an act of greater justice to call it Barents Land after its real discoverer, as also to distinguish it from the southern island, which would continue to bear the appellation of Novaya Zemlya. Marsh, writing in 1584, calls the north island "Mathew's Land," by which we may infer that it had been seen and named, before the time of Barents, by the same individual whose name was conferred on the strait separating the two islands; for there is little or no doubt that "Matotschkin Schar" is a corruption of Matyuska, which is the diminutive of the Russian name Matvei or Mathew. Marsh calls it the Mattuschan Yar, whilst, according to Dr. Hamel, Matotschkin Schar is a corruption of Matyushin Shar, the correct form.

Further allusion to the voyage of Willem Barents is, I think, unnecessary. It is sufficient to say that he sailed along the entire west coast of Novaya Zemlya, naming the different prominent headlands and bays as he sailed past, and fixing their positions so correctly as to prove his skill and accuracy as a surveyor and navigator. The Dutch names given by Barents remain in the chart to this day. The two voyages, one in 1594 and the other in 1596–7, undertaken by this intrepid and energetic Dutch seaman, are of the greatest importance when taken in connection with those of more recent times, for they enable us to form a very fairly correct estimate regarding the conditions of the ice in those seas three hundred years ago, by which we know that it has undergone little or no change during that long period—at least not more than is usually found from year to year, for it is well known how very erratic are the movements of ice.

It also shows how very little has been effected in those regions, in spite of modern improvements and the immense advantages derived from steam power, since the gallant Dutch sailed round the northern extreme of Novaya Zemlya, for it is only within the last eight years that Barents' winter quarters have been visited since that time. This significant fact, I fear, is a lamentable sign of the want of enterprise of the present day.

We now come to the voyage of Henry Hudson in 1608, that adventurous British seaman who, the previous year, had, in a small vessel with a crew consisting of ten men and a boy, undertaken to sail to China and Japan across the North Pole! Hudson reached the coast of Novaya Zemlya, in the vicinity of Cape Britwin on the 26th of June, having sailed to the eastward from lat. 75° 29′ along the pack edge, which he found to be impenetrable in a northerly direction. This is not to be wondered at, considering the early time of the year that Hudson was there. Had he remained for another two months he would, in all probability, have found a clear and open sea, in which he would have sailed to a high latitude, instead of which he returned to England, arriving at Gravesend on August 26th.

During the seventeenth century many adventurous voyages were made by the Dutch whalers, among which may be mentioned that of Captain William de Vlamingh, who, according to his own account, reached the high latitude of 82° 10′ in a north-westerly direction from Novaya Zemlya, meeting little or no obstruction from ice. This statement must be received with due caution, for, if he reached the position claimed, he must undoubtedly have seen Franz-Josef Land, the southern edge of which is in latitude 79° 50′. At any rate, whether his position is correct or not, there is little doubt but that he sailed to the northward of Novaya Zemlya without any hindrance from ice. Another Dutchman, Cornelis Roule, in about 1698, also claims to have sailed as far as 85° due north of Novaya Zemlya, where he discovered land! If any reliance is to be placed on the veracity of this statement, the honour of discovering Franz-Josef Land is due to Cornelis Roule.*

In the year 1676, Charles II. of England was induced to send out an expedition for the purpose of attempting the north-east passage. The conduct of it was entrusted to a Captain Wood, and two small vessels were placed under his command. He did little else but sight the edge of the pack in latitude 75° 59′, on the 22nd June, but, like Hudson, he was much too early in the season. Standing over to Novaya Zemlya, one of his ships was lost on a reef of rocks, the crew being saved and brought to England by her consort without attempting further exploration. With the exception of three voyages made during the last ten or fifteen years by yachtsmen, this voyage of Wood's was the last undertaken by Englishmen towards Novaya Zemlya, and these yachting cruises of modern times were solely for the purpose of sport and *not* for exploration.

Up to the eighteenth century no attempts had been made to explore the east coast of Novaya Zemlya, with the exception of the north-east extreme where Barents wintered. Russian walrus hunters had however, at various times, visited the coast, whence they returned with reports that the mountains contained large quantities of silver ore. In consequence of these rumours an expedition was set on foot by a rich merchant of Archangel, but the death of the originator nipped it in its bud.

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* See '*Noord en Oost Tartarye, door Nicolas Witsen*,' p. 920.

In the year 1760, another Russian, named Sawwa Loschkin, sailed with the object of exploring the east coast. Although little is known regarding this expedition, it is on record that he passed into the Kara Sea, through Burrough Strait, and successfully circumnavigated both islands, rounding Cape Mauritius, and sailing down along the west coast. He encountered great difficulties from the ice in the Kara Sea, and was occupied no less than three summers in performing the journey from the Kara Strait to Cape Mauritius. His two winters were therefore spent on the east coast.

In 1768–1769, Lieutenant Rosmyssloff, who had been an officer in the Russian Navy, undertook to explore Novaya Zemlya, and, in the interest of an Archangel merchant, to seek for silver ore. He sailed from Archangel on July 10th, in a small vessel with a crew of thirteen men, and reached Goose Land on August 3rd. Thence he proceeded northwards, making a thorough examination of the coast as he sailed along, until he reached the Matyushin Shar, through which he sailed, finding the Kara Sea perfectly free from ice. Being provided with a wooden house, which had been put on board the ship in pieces, he determined upon wintering. The house was set up, but not being large enough to accommodate the whole party, he pulled down a hut that had been erected before by some hunters, and transporting the material to his winter quarters, built a second house, dividing his party between the two.

On the 1st of October the strait was covered with ice, and five days later the Kara Sea was frozen over. On the 5th of November the sun disappeared, and the long winter night commenced, during which they suffered greatly from the want of space and air, in their wretchedly constructed huts. The sun reappeared on the 4th of February, and a week after a herd of reindeer was seen. One of the men was immediately despatched in pursuit; he succeeded in shooting several, but before he could return a heavy snowstorm overtook him, he lost his way, and was buried in a drift. Towards the end of June, Rosmyssloff determined to complete his examination of the Matyushin Shar; this was successfully performed over the ice. In addition to his hydrographical work, he made extensive and valuable observations regarding the fauna, flora, and geology of the country, and appears to have been a most observant traveller. He was the first person to determine the length and breadth of the Matyushin Shar. The strait was free of ice in the first week of August, but the damaged condition of the vessel and the weak and sickly state of the crew prevented Rosmyssloff from pushing further north. Whilst patching up his ship, he was fortunately fallen in with by a Russian fishing vessel, which conveyed the lieutenant and his men to Archangel, where they arrived on the 18th of September.

For nearly forty years after the return of Rosmyssloff, the shores of Novaya Zemlya were unvisited, except by those engaged in the pursuit and capture of walruses and other oil-yielding animals. But in 1807 Count Rumanzoff equipped an expedition at his own expense for the purpose of examining the country, with a view to its mineral products. This examination was entrusted to one Ludlow, who held a high official position in the management of the Ural mines. An ex-lieutenant in the Imperial Navy, Pospeloff, was engaged as captain, and his crew consisted of a pilot and eight sailors. In addition, eight miners were embarked, to carry out the chief work of the expedition. They sailed on the 9th of July, 1807, in a little vessel of 35 tons burden, and on the 28th reached the neighbourhood of the Kostin Shar, where a thorough examination was made by Ludlow and his assistants for minerals, but without success. On the 8th of August they sailed northwards, reaching the Matyushin Shar three days later.

Anchoring in Silver Bay (so named by Ludlow, not on account of the presence of silver, but because the quantity of talc which he here saw mingled with the slate caused a metallic glittering similar to the white glimmer that would have been produced by the precious mineral), he made a diligent search for ore, but no traces was he able to discover. Pospeloff was unable, from the want of assistance, to do much towards the cartography of the island, but he projected a very serviceable sketch chart of the west coast of the south island.

In 1819 the Russian Government fitted out a brig named the *Novaya Zemlya*, for the purpose of making a complete survey of the east coast, but bad luck appears to have attended this expedition throughout. The command of it was entrusted to Lieutenant Lasareff, and his ship was prepared to winter. They sailed from Archangel on the 10th of June, and attempted to reach the Matyushin Shar, but falling in with some heavy streams of ice, they changed their course to the southward, hoping to enter the Kara Sea, through Burrough Strait. Here also their progress was arrested by ice. After striving in vain for some days to push through, Lasareff made another attempt to go north, but scurvy breaking out among his crew, he returned to Archangel, without having accomplished anything.

Undeterred by the want of success of this expedition, the Russian Government in 1821 sent another vessel of the same name, of 200 tons burden, built and strengthened expressly for ice navigation. The command of it was given to Lieutenant Lutke, with instructions to examine the coasts of Novaya Zemlya, to determine the positions of the loftiest and most conspicuous mountains, and above all to ascertain the true length and breadth of the Matyushin Shar. His crew consisted of two officers, a doctor, pilot, and thirty-nine men.

For four consecutive years, namely, 1821, '22, '23, '24, was Lutke employed in surveying the west coast, during which time, although the seasons were apparently unfavourable, he did good work. The coast-line is very accurately delineated on his chart, and I was myself able, during my recent cruise, to verify a great many of the positions laid down by this excellent navigator more than fifty years ago. His observations extend no further north than the Pankratjeff Islands, the ice, on all occasions, offering a bar to his advancing beyond Cape Nassau. But Lutke, it must be observed, always relinquished his attempts to reach a high latitude, and to round the northern end of Novaya Zemlya, either in the months of June or July, or during the early part of August, believing, in the latter case, that the season was too far advanced to make further exploration prudent.

Had he waited until the beginning of September or even the end of August, the ice-fields that obstructed his passage would have vanished, and he would have had no difficulty in sailing round the north extreme of the island.

It is a significant and important fact that the edge of the pack between Spitzbergen and Novaya Zemlya, with only one or two exceptions, has been invariably found by different navigators during the last 300 years, in the same position, at the same time of the year. During the month of August the lapse of a few days will make a marvellous difference in the position of the ice.

The next contributions to our knowledge of the shores of Novaya Zemlya are due to expeditions sent out between the years 1832 and 1836, by private individuals belonging to Archangel. The principal object was the laudable one of attempting to re-establish the old trade through the White Sea to the Obi. Being interested in science, the originators were also desirous of combining with their mercantile transactions, the exploration of the east coast of Novaya Zemlya. Lieutenant Pachtussoff was entrusted with the chief command of the first that sailed.

From experience derived with the Russian walrus hunters he had become convinced that their flat undecked boats, called "karbasses," were the most suitable for ice navigation. A vessel was therefore built, according to his plans, in the form of a karbasse, which was 42 feet long, had 14 feet beam, and a depth of 6 feet. Cabins were built in the fore and after ends of the vessel, and the crew consisted of two officers besides the captain, and seven peasants! Pachtussoff's instructions were to sail into the Kara Sea, and work up along the east coast of Novaya Zemlya from the southward. In the meantime two other vessels were fitted out under the respective commands of Lieutenant Krotoff, and the pilot Gwosdareff, who were to proceed along the west coast, and co-operate with Pachtussoff after joining company with him in the Matyushin Shar, hoping through their joint efforts to make a very complete survey of the entire coast of the south island. They sailed from Archangel in the early part of August 1832, and ten days after

Pachtussoff sighted the south-west coast, to the eastward of the Kostin Shar. After many unsuccessful attempts to push through Burrough Strait, they reached Kamenka Bay at the south-east extreme of Novaya Zemlya, and here Pachtussoff determined to pass the winter, a decision mainly formed on account of the immense quantities of driftwood that he observed along the shore. During the winter the commander did his best to ensure the health and spirits of his men, by keeping them constantly employed. The sun returned on the 19th of January, after an absence of sixty-five days, and on the 18th of April they were able to recommence their examination of the coast. Towards the end of June the sea was free of ice, and shortly after, Pachtussoff started with only two men, and a month's provisions, to make a boat journey along the east coast, and endeavour, if possible, to reach the Matyushin Shar. This was a bold and adventurous proceeding. On the 15th of July he reached the latitude of 71° 38′ 19″ N.; but his progress being here obstructed by ice, he relinquished further attempt to go north. Returning to winter quarters he found his ship ready for sea, and lost no time in pushing on. On the 31st of July he reached a large bay, to which he gave the name of Lutke. The cairns and crosses erected by Pachtussoff in this bay were standing when the place was visited by us three months ago.

Continuing his northward course, he reached, and named, on the 22nd of August, Shubert Bay, and subsequently two more bays further north, to which he gave the names of Brandt and Klokoff respectively. On the 23rd of August they entered the eastern end of the Matyushin Shar. The Kara Sea was then so free from ice, that no difficulty would have been experienced in going further north, but to do so would have necessitated another winter, and for that they had neither strength nor provisions remaining. On the 27th of August they sailed through the Matyushin Shar, but found no signs, as anticipated, of either Krotoff or Gwosdareff, who were expected to winter in that locality. On the 5th of September, Pachtussoff reached Kolguiev Island, and finding his little vessel, from her encounters with the ice, to be in a seriously damaged condition, he gave up the idea of taking her to Archangel, and ran into Petchora instead, where he left his crippled craft, travelling himself by reindeer sledges to Archangel, which he reached on the 10th of December. He found that Gwosdareff had already returned, having had fairly good sport with the walruses, but of Krotoff there were no tidings. Pachtussoff lost three men during his cruise, two of whom died in winter quarters.

In the following year another expedition was despatched, and this time under the auspices of the Russian Government. It consisted of two small vessels. The command of one was given to Pachtussoff, and the pilot Ziwolka was placed in charge of the other. The crews of both ships only numbered seventeen, but they were both prepared to winter. The main object of the expedition was to discover the fate of Krotoff, and to explore the east and west coasts of the north island.

They sailed from Archangel on the 3rd of August, but the ships were separated in a fog on the 19th, joining company again, however, on the 6th of September at the western entrance of the Matyushin Shar, where, on the 25th of September, the ships went into winter quarters, in a small harbour on the north side of the channel. In April these indefatigable men commenced their observations—Pachtussoff confining his to the strait, whilst Ziwolka was entrusted with the exploration of the east coast, north of the Matyushin Shar. Pachtussoff made a very complete chart of the strait, his observations agreeing very nearly with those previously made by Rosmyssloff.

His work completed, he returned to winter quarters, where he set to work to build a small vessel in which to sail round the north end of Novaya Zemlya, deeming it prudent to leave his own ship as a depôt, in case of any accident happening to the one in which he was about to explore. In the meantime Ziwolka had reached as far north as Cape Flotow on the east coast, when the diminished state of his small supply of provisions compelled him to return, after an absence of thirty-four days from the ship. At his extreme northern point he erected a couple of crosses, made from the driftwood with which the coast of Novaya Zemlya is so plentifully supplied, on which was inscribed the date of his visit. These spring operations were all carried out with sledges.

On the 9th of July the Matyushin Shar was free of ice, and the next day Pachtussoff, accompanied by Ziwolka, sailed up the west coast in the little boat he had just constructed! He took with him two smaller boats and provisions for three months and a half. At his winter quarters he left behind two invalids, with a couple of men to look after them. Near Silver Bay they found the remains of a shipwrecked vessel, which they concluded belonged to the unfortunate Krotoff, who, with his crew, must have perished the preceding year.

On the 19th of July they reached Willem and Berg Islands, round which they found much ice. In attempting to sail between these islands, the ice closed round their frail little bark and completely destroyed it. Such an eventuality had been foreseen by Pachtussoff; and arrangements had been made which resulted in the smaller boats, provisions, and other necessaries being saved. Whilst in this rather critical position a vessel suddenly, and most opportunely, made its appearance. She was a small "lodia," engaged in the capture of walruses. Pachtussoff and his crew were taken on board by their countrymen, who, however, remained in the neighbourhood until the 10th of August in pursuit of their avocations. On that day they weighed anchor, and going south, reached their ships in the Matyushin Shar on the 19th.

The indefatigable Pachtussoff, dissatisfied with the work that had been accomplished, at once made arrangements for continuing the exploration of the east coast in a small "lodia." On the 20th of August he started with five seamen, sailed through the Matyushin Shar, and working his way through loose streams of ice, reached the island, that now bears his name, in latitude 74° 21', about 20 miles beyond the position reached by his subordinate Ziwolka. From this position high land was seen about 40 miles to the northward, which he called Daljnynoss; but heavy ice made it impossible for him to proceed further north. The 8th of September saw this energetic and bold navigator back again in the Matyushin Shar, whence he sailed homeward on the 13th. The expedition was absent 440 days, during which time two of the crew died. The gallant Pachtussoff, who never spared himself, suffered so much from the hardships and privations endured during the cruise, that he died of nervous fever shortly after his arrival at Archangel.

In 1837, Baer sailed to make scientific observations in Novaya Zemlya, but, though this expedition was very important in its natural history results, it was not so interesting from a geographical point of view.

In the following year another Russian Government expedition was despatched to complete the observations along both coasts. It consisted of two schooners, which were built expressly for the purpose. One was named the *Novaya Zemlya* and the other the *Spitzbergen*. The first-named ship was commanded by Lieutenant Ziwolka, and the other by Lieutenant Moissejeff. The sum total of both crews amounted to twenty-four. They took out with them a house for wintering in, and they were ordered to sail, if possible, round the north end of Novaya Zemlya and down the east coast. They sailed on the 7th of July, 1838, accompanied by a "lodia," which was carrying their house together with a few other stores. On the 30th of August, leaving Moissejeff to put up the house and establish winter quarters in Cross Bay, in lat. 74° 10', Ziwolka pushed on with the view of sailing round the north end of Novaya Zemlya, but being seized with illness he was forced to turn back. Both ships passed the winter in Cross Bay, and, from all accounts, their crews suffered terribly from cold and sickness. Ziwolka died on the 26th of March. On the 16th of April, Moissejeff attempted to explore the coast in the vicinity of their winter quarters with dogs and sledges, but the party suffered so terribly from the cold and snow-blindness that they were compelled to return after an absence of only forty-eight hours. On the 21st he made another attempt, but the exhaustion of his men obliged him to return again on the 29th.

On the 17th of May, the following entry appears in Moissejeff's journal:—"We have lost eight men, eleven men are ill, and only five in good health, and the latter are very weak." This was, it must be admitted, a truly deplorable state of affairs, but it was not sufficiently so to subdue the spirits of the gallant little band. On the 2nd of July both ships were free, when Moissejeff, ordering one to the southward, on the 23rd, to take observations on the Kostin Shar, sailed with the other the following day to the north. Meeting some walrus hunters off Admiralty Peninsula, he was told that impenetrable ice would be found off the Pankratjeff Islands; so, giving up all hope of carrying out his instructions, he returned to Archangel.

Moissejeff attributed the great mortality and sickness of his men to their original delicacy, and not to the severity of the climate!

This was the last expedition despatched by Russia for the exploration of Novaya Zemlya, but hunters from that country annually visit its shores, bent on the capture of walruses, seals, white whales, and salmon. These add little or nothing to our geographical knowledge of the country. Important and interesting voyages, however, have been performed by Norwegians engaged in the same trade. In 1870 the circumnavigation of Novaya Zemlya was, for the second time,* successfully executed by Captain Johannesen, who had also, the previous year, made a very remarkable voyage along the east coast.

In the following year, Captain Carlsen (who afterwards served on board the *Tegetthoff* in the memorable Austro-Hungarian Expedition of 1872) made a most interesting voyage, for not only did he succeed in circumnavigating Novaya Zemlya, by sailing up the west side and rounding the northern point, and so down along the east coast, but he also visited the winter quarters of the old Dutch navigator Willem Barents, the solitude of which had been undisturbed for 274 years.

Both these last-mentioned voyages were performed late in the year.

The next to engross our attention is the pioneer voyage made by Weyprecht and Payer (at the same time that Carlsen was making the circuit of Novaya Zemlya), in the little cutter yacht *Isbjorn*, the same in which we have recently been prosecuting our researches. This expedition, on the 1st of September, reached the high latitude of 78° 38′, in the 42nd meridian of east longitude. In this high position Payer writes: "The ice around us presented no serious impediment, as far as we could see," and had it not been for the opposition of their Norwegian crew, they would in all probability have reached a much higher latitude, and possibly anticipated those discoveries which were made by them two years later. The cruise of the *Isbjorn* in 1871, is a very important one, for, combined with others, it shows how easily a high latitude may be reached in those seas which have hitherto been regarded as almost unnavigable, provided such attempt is made at a comparatively late season of the year.

The next year, 1872, was a notoriously bad one, so far as ice is concerned, in the Barents Sea, and, taken in conjunction with other seasons, must be regarded as very exceptional. It was during the month of August in this year that the *Tegetthoff* was beset in the comparatively low latitude of 76° 22′, never to be again released. It is unnecessary for me to enter into any details in connection with this expedition; they have been already described to this Society, and are well known to all geographers. The great mistake, if it can be so called, made by Lieutenant Weyprecht, was that of pushing his ship into the ice so early in the season. Had he patiently waited a few days, or even a few weeks, before attempting to penetrate the pack, he would assuredly have been saved the two anxious winters he was doomed to spend in his icy bondage; for he would then have ascertained that it was an unusually bad ice year, and would therefore have refrained from pushing on. The two most essential requisites for the leader of an Arctic expedition are patience, and the moral courage to turn back when all hopes of success are dissipated. From conversations that I have recently had with several Norwegian sailors, who were not far from the *Tegetthoff* at the time she was beset, I am fully persuaded that the year 1872 was an exceptionally unfavourable ice year, so far as northward progress is concerned.

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* For the first time (see p. 8) in 1760 by the Russian Sawwa Loschkin.

It is remarkable that, in this same year 1872, the sea on the east coast of Spitzbergen was freer from ice than had been known for twenty years. On July 28th, 1872, the Norwegian captain Altmann reached the coast of Wiche's Land, later in the month Captain Nils Johnsen followed him, and during the first week of August Captain Nilsen sailed along the north coast of Wiche's Land, the sea being free from ice to the east and north.

Thus we find that when there is an exceptionally bad year for going north in the Barents Sea, the sea on the east coast of Spitzbergen is unusually free from ice, while in ordinary years the ice prevents the east coast of Spitzbergen from being approached. The deduction is that in ordinary years the ice is drifted against the Spitzbergen coast, leaving the sea navigable to the north in August and September; while in exceptional years, owing to failure of prevailing winds, the Barents Sea remains full of ice, and the Spitzbergen coast is comparatively clear.

I have been unable to obtain any statistics regarding the locality and conditions of the ice during the year 1873 in the neighbourhood of Novaya Zemlya, and as the *Tegetthoff* was frozen in to the northward of 79° 40′ during the navigable season of that year, it would be unfair to call it a bad year from the mere fact of no open water being observed from that vessel, when close to the land, the fast, or land ice, always being the last to break up.

On the retreat of the crew of the *Tegetthoff*, after the abandonment of their ship in the following year, we are told that they reached the open water in latitude 77° 49′ on the 15th of August, 80 miles further north than the latitude in which they were beset two years before, and five days earlier in the season! This fact, in my opinion, taken in conjunction with the experience of all navigators who have sailed in the Barents Sea, does not prove that the year 1874 was an unusually good one, but that the year 1872 was exceptionally bad. The expedition of the Dutch in 1878 tends materially to confirm this opinion, whilst the great success they have achieved this year, only strengthens and corroborates my views on the subject. I will not take up your time by describing the cruise of the Dutch in the summer of 1878; it has been already related in detail to this Society, and will be found in the 'Proceedings' for 1879.

Another remarkable voyage was also undertaken in 1878, by which geography has been enriched by the discovery of a hitherto unknown island, situated to the north-east of Novaya Zemlya.

In command of the Norwegian schooner *Nordland*, Captain Johannesen left Tromsö on the 22nd of May, and directed his course towards Novaya Zemlya, which he reached on the 6th of June. Sailing up the west coast, the Pankratjeff Islands were reached on the 21st of June, and a month later Cape Mauritius. On the 30th, having passed through some streams of loose ice, Barents' winter quarters were reached on the 30th. Sailing the next day, he remained off the north coast of the island hunting for walruses, until the 10th of August, when he shaped a course to the eastward, meeting with but little ice, but being greatly pestered by fog and rain. On the 16th, during a brief interval of clear weather, land was sighted towards the S.S.E. This was the coast in the vicinity of Cape Taimyr. Thence he sailed west and then north, occasionally meeting ice, but never in sufficient quantity to cause alarm or anxiety. On the 28th of August he saw an island, bearing north-west. On the 1st of September he sailed along its southern coast, then up the west side to the north, and so made the complete circuit of the island. The west side is reported to be steep and precipitous, rising to a height of about 100 feet, but the east side is low and shelving, and on it lay large quantities of driftwood. On this side landing would be practicable when the coast is unencumbered with ice. Along the south side were a number of grounded masses of ice, but whether of fresh or salt water formation is not stated. In the centre of the island there appeared to be a lake, but no vegetation was visible. Bears, walruses, and seals, and many kinds of birds were seen. The island was set down as being in 77° 40″ N. lat. and 86° E. long. It was named "Einsamkeit," which means "lonely," or "solitude." Sailing on the 3rd of September, Johannesen shaped a course to the north-west, reaching the 78th parallel *without meeting ice*. On the 6th, he was off the east coast of Novaya Zemlya, which was entirely free from ice. From the 10th to the 11th he was off Cape Mauritius, eventually reaching Tromsö, after a most adventurous and successful cruise, on the 27th of September.

I will now proceed to give an account of the trip in which I have recently taken part, and which, though successful in a geographical point of view, would have been more so had it not been for the unwillingness evinced by our Norwegian crew to face the ice.

The conception of the cruise was entirely due to our newly elected Associate, Sir Henry Gore-Booth, who to his qualities of a keen and successful sportsman adds those of a practical geographer and an ardent admirer of nature. Early in the year I gladly accepted his invitation to accompany him on a sporting trip to Novaya Zemlya, with the understanding that we should afterwards examine the ice in the Barents Sea and other localities, during what I considered to be the navigable season, namely, during the month of September. For our cruise he had hired the little Norwegian cutter *Isbjorn*, already rendered historical by her exploits under Payer and Count Wilczek. Since the cruise of the latter gentleman the little vessel had been employed fishing in Spitzbergen waters and off the coast of Norway.

The *Isbjorn* is a vessel of 43 tons burden. She is 55 feet long, with a beam of 17 feet. She was built in 1870, and made her first voyage in the following year with Weyprecht and Payer. She was cutter rigged, but was fitted, in addition, with a square topsail.

As the *Isbjorn* was essentially a cargo-carrying vessel, our accommodation was, as may be imagined, on a limited scale. The cabin, common to both of us, in which we slept, had our meals, and did all our work, was 5½ feet in length, by 5 feet 9 inches in breadth. Our crew consisted of a skipper, a mate, two harpooneers, and five seamen. The latter all lived in a small place in the fore part of the vessel. The harpooners were the only men in the ship who had ever navigated the icy seas, and were therefore regarded by the skipper and remainder of the crew, as the great authorities on all subjects connected either with the ice or with sport. The captain was only captain in name, and because he was owner of the cutter; he was a good fisherman, but made no pretensions to being a navigator, indeed, it is very doubtful whether he had ever seen a sextant or chronometer before we went on board. The *Isbjorn* had been expressly built for ice navigation, and was therefore extra strengthened, having considerable beam power inside, whilst she had a 3½-inch oak doubling outside. The stem was armed and protected with bands of iron, similar to those used by the Dundee and other whalers, whilst the inside was strongly fortified. Considering her size she was, for a sailing vessel, well adapted for such work as was anticipated, being, in smooth water, a very handy little craft.

But here I cannot help strongly expressing my opinion regarding the employment of vessels unprovided with steam power in exploring the icy seas. At the very moment when the ice is more open than at any other time, namely in a calm, a sailing vessel is perfectly helpless, and at other times, when there is a fair wind through the pack it would be imprudent for a commander to run on, because to extricate himself from the ice, he would have to work to windward in an ice-blocked channel. Although most successful work has been accomplished in the Arctic seas by sailing ships, there is no doubt that had those vessels been steamers, much more would have been achieved. Yet this year we have an example of a small sailing vessel not only reaching, but also returning from, a country which a steamer approached, in 1873, by being helplessly drifted in the ice, only to leave her timbers bleaching on the shore. There is little doubt that had the *Willem Barents* possessed steam power, she would, this year, have made one of the most brilliant and successful summer cruises in the Arctic seas ever recorded.

Our crew shipped, chronometer rated, and stores and provisions to last us until the beginning of October on board, we sailed from Tromsö on the 18th of May, but finding our vessel rather *crank*, we put in to Hammerfest on the 25th, in order to take in ballast, sailing again the following day.

Passing through the fjords to the southward of North Cape, we shaped a course to the eastward, and experiencing fine weather, made the first ice on the 4th of June, about 40 miles due west of Goose Land. It consisted of loose streams of light brashy ice, sufficiently packed in some places to form an obstacle to navigation. It was what is called light floe ice, of only one season's formation, and was well "rotted" by rain and the motion of the sea. In places where excessive pressure had been exerted, the hummocks were piled up to some height.

I inferred that this ice had been formed to the southward of Novaya Zemlya, between Kolguiev and Waaigat Islands, and had been drifted to where we found it by the recent south-east winds.

This inference was, I think, a correct one, for after remaining in this ice for three days hunting walruses and seals, we had no difficulty in sailing through it, and reaching an unencumbered sea in the 72nd parallel of latitude. The temperature, whilst in the ice, was some three or four degrees below the freezing point, and the cold biting wind made it keenly felt. This wind brought us our first visitor from Novaya Zemlya, in the shape of a beautiful little "sylvia," about the size of a wren, having the most brilliant blue neck and breast. The poor little bird fluttered around us for a few minutes, and then alighted upon the bulwarks, innocently imagining it would be allowed to rest, but instead of kind treatment and a warm welcome, it was ruthlessly attacked and killed by a blow from a broom that would have felled an ox. It was a rare specimen to be found so far north, and was therefore sacrificed in the interests of science.

Our first encounter with the ice gave us convincing proof of the aversion of our Norwegian crew to making a closer acquaintance with it. In justice to some of the men, I must say that this timidity on their part or, I will say, their dislike to push the ship into the ice, was entirely due to the harpooners, who, being supposed to be experienced icemen, were naturally the oracles of the crew. Whatever they said was bound to be accepted as the truth, and I rather think we were regarded as mad hair-brained Englishmen, ignorant of everything connected with ice navigation, sport, or anything else.

On the 9th of June we obtained our first glimpse of Novaya Zemlya, the low snow-covered coast of Goose Land. These low, flat, jutting out points and peninsulas, such as Goose Land, Suchoi-Noss, Admiralty Peninsula, and others, form a very peculiar feature of the otherwise bold mountainous scenery of the west coast. In the vicinity of these low lands, the water is very shoal, and it is unsafe for a vessel, even for a small one like the *Isbjorn*, only drawing six feet of water, to approach within a mile of the shore. Even at a distance of four miles we obtained soundings in 10 and 12 fathoms. The whole country lay buried in one impervious mantle of snow.

To the southward of Cape Britwin, on the following day, to our intense surprise, we observed a little craft bearing down towards us. It proved to be a small undecked boat about 18 feet long, containing five Samoyedes, two men, a woman, and a couple of children, and four wretched-looking dogs. The Samoyedes were clad in reindeer-skin coats with hoods, and sealskin trousers and boots. They were of short stature, bearing a strong resemblance to the Eskimos, and possessing the same Mongolian type of features, namely, high cheek bones and oblique-shaped eyes. They appeared merry and good-tempered, and boarded us in a very unceremonious manner, the lady being handed up the side in true cavalier style by our gallant skipper, who, however, treated the children in a ruder fashion, by seizing them summarily by the nape of the neck, or rather by the nape of their reindeer-skin habiliments, and thus lifting them, *nolens volens*, on board! They spoke a little Russian, so through the medium of our mate, who understood that language, we ascertained that they had passed the winter in a hut, not far from where they met us, and that they were then on their way down to the Kostin Shar to visit their friends—a settlement of Samoyedes being established in that neighbourhood. A Russian had passed the winter with them, and had been left in charge of the hut. They informed us that the *Isbjorn* was the first vessel they had seen this year, and that the ice along the coast had broken up eight weeks before. Our visitors remained on board for upwards of an hour, when, after we had supplied them with a little biscuit, they took their departure. In their boat they had the runners and framework of a sledge, and their dogs were all accoutred in their sledging harness.

On the 12th we anchored in a harbour called on the Russian charts, Nameless Bay. This bay had the reputation of being a famous place for "looms," as Brunnich's guillemots are invariably called; and as the last of our fresh meat had been consumed, we determined to replenish our larder from the loomeries. High hills of from 800 to 1500 feet bounded the harbour on three sides, leaving the entrance open to the westward. These hills sloped down towards the water, terminating in abrupt and precipitous cliffs of limestone formation, of about 100 feet in height. The cliffs, on the face of which the action of the weather and frost had formed narrow ledges in regular stratifications, rising tier over tier from the base to the summit, were the loomeries! On these ledges could be seen the birds congregated together in regular lines, not in thousands but in myriads, the face of the cliffs assuming a "pepper and salt" hue, from the combination of their black and white plumage. Some idea may be formed of the countless number of these birds, when I say that in two hours my companion and myself, with our two guns, bagged 600! On the first discharge of our guns, a perfect cloud rose in front of us, completely obscuring the face of the cliff; and I can only compare the noise made by the whirring and flapping of wings, to that produced by the fall of water from a large cataract. As they flew seawards they actually struck us in the boats, whilst the killed and wounded fell upon us like hail! The incessant flight of these birds in different directions reminded me more of the swarming of hundreds of hives of bees than anything else. The "loomeries" were entirely confined to the southern shore of the bay, along which they extended for three miles.

Under some of the cliffs were large caverns worn away by the action of the sea, whose entrances, in some instances, were almost blocked by heavy masses of pure white snow, whilst clusters of large transparent icicles hung pendent like stalactites from the top, forming a beautiful fringe or fret-work, which reflected the most lovely prismatic colours as they caught the rays of the midnight sun. The land above the cliffs rises in regular raised terraces to the base of the more lofty ranges of hills that form such a conspicuous feature of the west coast of Novaya Zemlya, showing clear indications of its upheaval. Another sign of the recent upheaval of the land was the discovery of a piece of seaweed in a small fresh-water pond 300 yards from the beach and 75 feet above the level of the sea. From the summit of the cliffs to the first raised terrace is a broad and level plateau which, after the snow has disappeared, is covered with a rich and luxuriant vegetation, on which the numerous herds of reindeer, indigenous to the island, subsist. This plateau is peculiar to the west coast, where it is fringed by steep cliffs. We found during the month of June, and even during the greater part of July, the snow very deep, rendering walking excessively laborious. I don't know that matters were much improved by the thaw, for then the soil was made so soft and tenacious that it was quite as bad as walking through deep snow.

The snow lies on the ground in Novaya Zemlya to a much later date than it did at the *Alert's* winter quarters, and the fall of snow is more excessive, judging from my experience at both places.

Numerous traces of former inhabitants are everywhere to be found in Novaya Zemlya, sometimes in the shape of ruined huts, and sometimes only in that of circlets of stones or old fireplaces and fox-traps.

The former owe their existence to Russian walrus-hunters and others engaged in the same pursuit, whilst the latter are the remains of old Samoyede encampments. These migratory tribes have frequently passed many years of their lives in the southern part of Novaya Zemlya in the neighbourhood of the Kostin Shar, but I have never heard of any wandering so far as to cross the Matyushin Shar. Cairns abound along the coast, one of these essentially Arctic landmarks adorning the summit of every prominent cape, headland, or mountain. I should be excessively sorry to command an expedition in search of men lost in Novaya Zemlya, if I had to examine every cairn I saw for tidings of the missing ones. These cairns are erected by the Russian and Norwegian fishermen in their idle moments.

We remained in Nameless Bay some days, during which time we succeeded in shooting a great many reindeer, and thus, with our birds, obtained a good supply of fresh meat.

Whilst working to the northward along the coast, we struck heavily on a rock, which cost us the loss of the lower part of our stem and several feet of the false keel. We succeeded in getting the ship off without much difficulty, and even before the watch below could make their appearance, who rushed on deck imagining the direst of evils had befallen us.

The coast of Novaya Zemlya, on either side, is one that requires caution on the part of those navigating along it, but with a careful and constant use of the lead little danger need be apprehended. Most of the rocks are awash, and may therefore be avoided by a good look-out being kept, even in foggy weather. The water shoals gradually towards the land, which, in thick weather, should not be approached too near.

On the 20th we sailed into the Matyushin Shar. We had no difficulty in making the entrance, the Russian charts being fairly accurate. Our English charts are on so small a scale as to be almost useless for the coast navigation.

In beating in, the northern shore should be avoided as much as possible as, off it, are a great many rocks and foul ground. In making the entrance from the southward, several conspicuous rocks may be seen jutting out from the south-west point of land. These may be approached without fear, as deep water surrounds them. Fresh water is easily obtainable on both sides of the channel from some of the numerous rivulets and watercourses that pour down from the mountains. Leaving a cairn, with a record for the Dutch expedition, as agreed between Captain de Bruyne and myself, on a prominent headland, we sailed up the strait on the 20th of June; but, alas! had only proceeded about 12 miles, when we were stopped by a barrier of fixed ice extending right across the channel. This was convincing proof that we were too early in the season, but it was only what we expected, for the Matyushin Shar is rarely navigable before the end of July or beginning of August. The scenery in this wonderfully formed channel is very grand, more especially on a fine sunny night, when the rays of the sun at a low altitude just "bathe in deep joy" the summits of the surrounding hills. These lofty ranges raise their crests to the height of from 3000 to 4000 feet above the level of the sea. Between them undulating valleys recede into the interior, covered with such deep snow as to conceal all rocky projections, and make them resemble glaciers in their milk-white opacity, rather than stretches of country which very shortly would be covered with a rich and luxuriant Arctic flora. Occasionally deep ravines, black and sombre-looking chasms, would separate the hills, their dark black cliffs forming a striking contrast to the universal whiteness that everywhere else predominated.

Our progress being checked in the Matyushin Shar, we resolved upon proceeding northwards along the west coast, deferring our observations in the Kara Sea until a later period in the season. During the few days we remained in this strait, I observed, what I considered a very remarkable incident connected with the congelation of sea water. This was that "pancake ice," that is young ice, was actually making on the surface of the water when the temperature of the air was as high as 39°! The temperature of the surface water at the time was 31°. This was taking place at the mouth of a large valley, through which a great quantity of fresh water, running down the sides of the adjacent hills, was being discharged into the sea. This fresh water suddenly being precipitated on to the sea water at a lower temperature, may account for the phenomenon. A great many seals, the *Phoca barbata* and the *Pagomys fœtidus*, lay basking on the ice in the channel, and afforded good sport to my companion.

The Norwegian sailors declare that the seals as they lie sleeping on the ice are carefully guarded and watched over by the Glaucus gulls, or burgomasters, as they are more frequently called; and that these birds act the parts of faithful sentinels, warning them on the approach of danger. On one occasion I was placed in a position to corroborate this assertion. My companion had left the ship, in one of our walrus boats, to shoot a seal which had been observed asleep on the ice. When he had approached to within about a hundred yards of his would-be prey, I saw a couple of these "burgomasters" soaring over the animal, occasionally swooping down close to its head, as if imparting some confidential communication. The Norwegian sailors on board at once drew my attention to the circumstance, at the same time saying that the birds were warning the seal of danger! The latter, however, took no notice except to lift its head and look for a moment in every direction but the right one. As the boat approached nearer, the birds alighted on the ice, and walking up to the seal, deliberately pecked it, as much as to say, "It's quite time to be off," on which the seal again raised his head, sighted the danger, and suddenly diving into his blow-hole, disappeared, sadly to the discomfiture of my companion. I relate the fact as it occurred, though it was the only instance of the kind that came under my notice.

Bad weather and adverse winds detained us at the entrance of the Matyushin Shar until the 27th, when we again got under weigh, and sailed northwards along the west coast. This coast-line forms a succession of large indentations in the land, any one of which affords good and safe anchorage, protected from nearly all winds.

North of the 74th parallel of latitude, large glaciers may be seen at the head of nearly every bay, winding their long sinuous forms between the mountain ranges, and in many cases meeting round the base of a hill, where, after elbowing each other for a short distance, they would join and flow down towards the sea as one gigantic mass. The snow, as we proceeded northwards, instead of diminishing with the advancing season, appeared to increase, the entire country being completely covered with it.

On the 2nd of July we sighted the edge of the pack ice extending to the westward from the Pankratjeff Islands. From this date until the 18th we made various attempts to penetrate the pack and push northwards, but always without success. The land ice was still adhering, and therefore formed an effectual barrier between the mainland and the numerous islands that fringe this part of the coast. From the summits of several hills that were ascended, the pack could be seen stretching away in a northerly and westerly direction. Here, then, as in the Matyushin Shar, we were too early in the year!

Here also, for the first time, did we see icebergs, but they were wretchedly small and insignificant in comparison with the grand glacial productions that are found in Davis Strait and Baffin Bay. Those that we saw were not more than between 10 and 20 feet in height, and were hardly noteworthy except for their brilliant blue colour. From not having seen any of these bergs further south, we may naturally presume that either the land ice had not broken up sufficiently to allow the fragments to float away as they broke off from the glaciers, or else that a northerly current had at once carried them in that direction.

The pack itself, which retarded our progress, consisted of loose streams of light ice, in no place sufficiently packed to offer a real obstruction to any vessel provided with moderate steam power. Yet it must not be forgotten that it was exactly in this neighbourhood that the *Tegetthoff* was beset, never to be released. But I have already attempted to prove, and I hope not entirely without success, that the year in which that vessel was caught was an exceptionally bad one. We saw no floes whatever, nor did the loose broken pieces of ice that we met, appear to be more than from three to five feet in thickness.

Under these circumstances, as sport was the main object of our cruise, it was deemed advisable, for the time, to relinquish the idea of pushing northwards, and to return again to the Matyushin Shar, which we hoped to find clear of ice, and then seek for walruses in the Kara Sea. The highest latitude reached by us on this occasion was 76° 18′. During our stay in the north we had several opportunities of visiting the different islands that lay off the coast, and amongst them Cross Island, so named by Willem Barents in 1594, from the fact of his having found two large crosses, made from driftwood, erected on the shore. The presence of those symbols of Christianity shows conclusively that the islands had been visited by white men, previous to their supposed discovery by the gallant Dutch navigator.

Cross Island possesses a melancholy interest as being the place where, seven years ago, Captain Tobiesen, an intrepid Norwegian walrus-hunter, and a most experienced and energetic ice navigator, ended his days. His vessel being beset in the ice, in the neighbourhood of Cross Island, in 1872 (the same year that proved so disastrous to the *Tegetthoff*), and there being no probability of her being released before the ensuing year, Tobiesen determined to stay by her in the hope of saving, if not his vessel, at any rate some of the stores and cargo. Accompanied only by his little son, and two seamen who volunteered to remain with him, he passed the winter in a small frame house, constructed from materials taken from his luckless vessel, and covered over with canvas. The remainder of his crew were received on board a Russian fishing vessel, and taken to the southward.

When the island was visited the following summer, only the two seamen were found alive, Tobiesen and his son having succumbed to that greatest enemy of Arctic travellers, scurvy! The former died on the 29th of April, the latter lingered till the 5th of July.

Captain Tobiesen, it will be remembered, made a most successful and adventurous voyage in 1864 round North-East Land (Spitzbergen). When we visited the scene of his winter quarters we found the little house standing in much the same condition as when its late occupants left it, whilst remains of the ill-fated ship and her cargo were strewed along the beach. The largest intact piece of the wreck was the bows, which was lying with the nose downwards, the stump of the bowsprit being buried in the snow. About 100 yards from the house were the graves of the father and son, marked by two little mounds of stones and a few small pieces of driftwood. Some eider ducks had built their nests under shelter of the stones, and on the boy's grave a little snow bunting had also constructed its nest; but alas, the nest it had built with so much care and trouble, in which to rear its young offspring, proved its own shroud, for the poor little thing was lying dead at the bottom, having in all probability been drowned by a sudden thaw! Captain Lyon noticed an exactly similar incident during his voyage of

1824. He, like us, remarked that the snow bunting has all the domestic virtues of our English redbreast, and Arctic voyagers consider it as the robin of those dreary wilds. A lady, on hearing the incident related, thus gave poetical expression to the feelings excited by it:—

"Sweet bird! the breast of innocence
Hath fadeless charms for thee!
Although the spirit long has fled,
And lifeless clay it be!

"Thou dreadest not to dwell with death,
Secure from harm or ill,
For on an infant's heart thy nest
Is wrought with fearless skill.

"And like our own familiar bird
That seeks the human friend,
Thou cheer'st the wandering seaman's thoughts
With home, his aim and end."

It was a melancholy and dismal scene that we gazed upon. The two graves in the foreground, and the dreary, almost weird-looking house, with its ghostly white pall of bleached canvas, resembling a large tomb or sepulchre, immediately behind, whilst around, in all directions, lay the débris of the ill-fated schooner. Beyond, stretched the mainland of Novaya Zemlya fading away in the far distance in a succession of snow-capped ranges, separated from each other by large glaciers, only to be distinguished by their smooth and regular surfaces. It was indeed an Arctic scene in its dreariest and saddest sense.

These islands on the north-west coast of Novaya Zemlya are composed of a dark limestone or slate, interspersed with large masses of whity-greyish quartz or felspar. The limestone is highly fossiliferous, abounding with mussels, brachiopods, crinoids, and even trilobites and coral.

The positions of these islands are very incorrectly laid down on all the charts; not only are they out with regard to their geographical positions, but also with regard to their bearings one from another. Some of the islands are altogether ignored on the charts.

On the 21st of July we again entered the Matyushin Shar. A marvellous alteration had taken place in the appearance of the surrounding country since we sailed away four weeks before. Then the land was wrapped in an impervious mantle of snow, but this, during the month of July, had disappeared, revealing in its place long stretches of luxuriant green sward in which the *draba*, the *papaver*, the *potentilla*, saxifrage, and the pretty little forget-me-not, with many other members of the Arctic flora, clustered in rich profusion. The summers in Novaya Zemlya are brief, but the flowers make the most of their short term of existence!

During one of our excursions on the north side of the channel we picked up a bottle, well corked, containing a strip of paper on which a few unimportant lines had been written by two men belonging to the steamer *Germania*, on August 9th, 1871. The *Germania* had been hired by the German naturalist Von Heuglin, who was engaged in scientific researches during the autumn of 1871, along the coast of Novaya Zemlya.

We were not destined to pass through the Matyushin Shar as easily as we anticipated. Sailing up with a fair wind, we passed the spot where a month previously our progress had been checked, and sailing onward with confidence, congratulated ourselves on the prospect of getting through; but a few miles further on we again came to an ice barrier, and one, apparently, of such a nature as to afford little hope of being cleared away until a much later period of the season. Anchoring the vessel, we walked along the shore in order to ascertain how far this ice barrier extended, when to our great delight we reached its eastern limit at eight miles distance. Knowing that a gale of wind would very soon disperse the ice, we resolved upon waiting, and in a week's time we were rewarded for our patience by seeing the ice clear away, and on the last day of July we had the satisfaction of sailing into the Kara Sea. The date quite agrees with what former navigators have said regarding the time that this channel is generally free of ice.

During our several detentions in the Matyushin Shar, extending over a period of about three weeks, we were able to determine, within a short distance, the point of junction of the two tides, namely, that of the Barents Sea and that of the Kara Sea. These two tides met at a point near Cape Walrus. East of that cape we found the tide flow to the westward, whilst the ebb ran to the east. West of Cape Walrus the reverse was the case, the flood tide being an easterly going one, and the ebb a westerly one. These observations were subsequently confirmed by those of Captain de Bruyne of the *Willem Barents*. Where the channel was very narrow, the tide flowed with great rapidity, on some occasions as much as 1½ and 2 knots an hour.

On the summits of some of the hills, on either side of the strait, and more especially on those at the heads of deep gullies or ravines, regular ice-caps or miniature glaciers are occasionally to be found. These ice-caps appear to me to be formed by the excessive snowfall during the year, which, never wholly melting, is in process of time converted by pressure and partial thaw into ice. One of these ice-caps bore a very decided resemblance to a glacier, and it was only after very careful and attentive observation that the land underneath it could be detected.

On one occasion I was able to observe a perfect section of one of these snow accumulations, which had the exact appearance of the rugged terminal edge of a discharging glacier. The face of this section appeared to be about 25 feet in height, but it was on the summit of a hill whose altitude was quite 1500 feet.

On reaching the Kara Sea, to our great disappointment we found it to be full of heavy ice, impinging on the points to the north and to the south, and extending to the eastward as one heavy solid pack. Between the pack and the coast, a narrow channel of what might be termed land-water existed, and in this we worked our way to the southward with the intention, if possible, of reaching Yalmal Peninsula, which had the reputation of being a good place for walruses. The difficulties we had to contend with may be imagined when it is stated that we were occupied sixteen days in going a distance of 60 miles!

In addition to the natural difficulties, we also had to overcome the objections of our crew to pushing onwards, and I think the latter was by far the hardest, and certainly the most disagreeable work of the two. The ice obstructions were of such a nature that, after reaching Cape Hessen, we decided to return to the Matyushin Shar. It would have involved too great a loss of time if we had persevered in our intentions of reaching Yalmal Land.

The existence of this ice-pressure on the east coast of Novaya Zemlya is exactly what is to be expected when the Barents Sea is tolerably open to the northward, for the same reason that the east coast of Spitzbergen is usually encumbered with ice. This year nearly all the straits leading into the Kara Sea were closed, so as to prevent steamers from reaching the mouth of the Yenisei. Captain Arendsen, in the schooner *Nordland*, did succeed in passing through the Pet (Jugor) Strait in the middle of August with great difficulty, yet when he got into the Kara Sea he found open water, in which he sailed up to the latitude of Ice Haven, but some 30 miles from the land. The ice was blown against the eastern coasts, and pressed up as we found it, and the open seas were navigable away from land, and along western coasts. This is an ordinary year.

The ice in the Kara Sea was excessively heavy, infinitely more so than the ice usually met with in Baffin Bay. It has been asserted that it is impossible for ice to be of the thickness we found it to be in what we called the Palæocrystic Sea, although we met with sections of floes exhibiting perfect striations, thereby indicating their regular growth. Such ice could not possibly have been formed by one floe pressing over another, and so on, until it reached the thickness reported by us. This theory of formation may account for a chaotic mass of broken-up ice, but it cannot be applicable to floes of any dimensions. In the Kara Sea I was able to measure a perfect section of a floe above the surface of the water, by which I obtained, according to the regular calculation of the flotation of ice, the result that the floe was 31 feet in thickness, and this floe, I may mention, was over four miles in diameter! Near the *Alert's* winter quarters there was a floe extending in an easterly direction for seven miles, on which Commander Beaumont, and other officers, travelled when they crossed over to Greenland. This floe must have been at the very least 40 feet in thickness, and was considered as very thin ice indeed when compared to the heavy ice met with by the northern sledge party.

During the time we spent in the Kara Sea, I was able to verify the positions of the different bays along the coast as determined by the Russian lieutenant Pachtussoff, and I was very much surprised at the extreme accuracy of his observations and the correct delineation of his coast-line, considering the circumstances under which his survey was undertaken.

The conformation of the land on the east coast of Novaya Zemlya is vastly different to what it is on the opposite side. On the east side, low undulating plains take the place of the noble hills, and deep valleys and ravines, for which the west coast is so conspicuous. Both coasts possess innumerable bays and harbours in which vessels may obtain refuge either from bad weather or the closing in of the pack. A very peculiar and noticeable feature of the east coast is, that where the land terminates in a cape or promontory it is invariably steep and precipitous, although perhaps not more than 50 or 100 feet high ; and where this is the case, there is always a large rock or islet some little distance off the point. These rocks, in consequence of their isolation, are very favourite breeding places for the gulls and guillemots, as they are perfectly inaccessible to foxes.

Some of the cliffs just referred to present a most distorted appearance, the stratifications being at all angles from the vertical to the horizontal. The action of the frost and weather, and more particularly the snow with its annual thaw, causes large portions of these cliffs of disintegrated limestone to wear away, and the fragments, being disconnected from the parent body, form the rocks and islets just alluded to.

During the time we were in the Kara Sea we enjoyed the most delightful weather, which enabled us to take long walks into the interior and along the coast, when the ice prevented any movement on the part of the ship.

On the 18th of August we re-entered the Matyushin Shar, where, to our surprise, we met the Dutch exploring schooner *Willem Barents*, and renewed our acquaintance with the officers. As she had left Europe more than a month after our own departure from England, we had the great pleasure of receiving home news. She had from the early part of July been employed in sounding, dredging and taking serial temperatures on different meridians in the Barents Sea, and had made most valuable and important observations regarding the physical geography of the part explored.

On the 6th of July she met the pack, consisting of extremely heavy ice, in lat. 75° 36′ on the 26th meridian ; and on the 20th of the same month, on the 41st meridian, drift ice was fallen in with in lat. 76° 30′.

Captain de Bruyne's intention was to proceed north in order to place two memorial stones, one on Cape Nassau, the other in Ice Haven, commemorating the discovery of those places by the intrepid navigator after whom their ship was named. With this view he had hoped to have been able to sail along the east coast of Novaya Zemlya, but on observing the state of the Kara Sea he had very wisely abandoned this idea, resolving to pursue his course northwards along the west coast.

Having agreed, if possible, to meet at Cape Nassau or at Ice Haven, and having arranged about depositing records, and building cairns in various localities to the north, the two vessels separated on the 22nd, each pursuing her own individual course to the northward.

And here I cannot refrain from mentioning the great kindness and consideration we received at the hands of Captain de Bruyne and the officers of the *Willem Barents.* Their programme was even slightly altered in order to suit our convenience; and our wants, and I fear they were many, were at once administered to. It is not too much to say that the stores of the vessel were almost placed at our disposal to take anything that we needed. I shall always look back with great pleasure to the time when the Dutch and English flags flew side by side for the first time in the Matyushin Shar, and to the kind reception we experienced from the gallant Dutch off the sterile shores of Novaya Zemlya.

On the 25th of August we ran in and anchored in South Solmenjeff Bay in order to await a favourable change in the weather. Near our anchorage was a large glacier entirely surrounding a range of hills. In fact, the glacier itself appeared to be split in two by the hills which seemed to grow out from the very centre. The range extended for about five miles, and was completely surrounded by the ice. During our stay I was able to visit and make a closer inspection of this glacier. Accompanied by one of the crew, I first walked along the beach until within a few hundred yards of its terminal face, the rugged edge of which rose perpendicularly out of the sea to a height of about 35 feet. At its base, and therefore in the water, lay scattered about a few fragments of ice that had been recently broken off, and which had not had time to be carried away by wind or tide. Crossing the lateral moraine, consisting of large heaps of mud and stones pressed and squeezed into all sorts of grotesque shapes, we ascended the side of the glacier, and reaching the top walked some two or three miles on it towards the interior.

For about a mile from the face of the glacier the surface was an irregular and chaotic mass of ice, apparently thrown together and tumbled about in the strangest confusion. I can compare it to nothing better than a boisterous turbulent sea instantaneously converted into ice. Deep crevasses, treacherously bridged over with snow, necessitated great caution on our parts as we walked along. As we advanced, the surface of the glacier assumed a smoother and more undulating character, and the walking was proportionately improved. In some places the ice was so smooth and slippery that we found great difficulty in keeping a perpendicular position, and much easier to make progress, however undignified it might have appeared, on "all fours"! There is nothing so deceptive to the eye as the appearance of the surface of a glacier. At a short distance it looks so smooth, and in some places so level that travelling over it appears easy enough. But on a closer approach the level plains are found to be intersected by broad rivulets running down towards the sea, which by constant friction have so worn away the ice that their beds are in reality chasms of many feet in depth—the smooth ice is too slippery to walk over, and progress is altogether very difficult. Some of the cracks or fissures were not many feet wide, and these we easily jumped over, the broader ones necessitating in some instances a long detour. The murmuring of the running water, and the low moaning of the wind, which had found its way to the bottom of these crevasses, some 80 or 100 feet immediately underneath us, had a very weird effect, enhanced, on gazing down into the fissures, by seeing the beautiful icicles of all sizes that fringed the sides. Having walked about three miles, we reached an estimated height of 800 feet above the level of the sea, and this was, I think, nearly the extreme altitude of the glacier. From this position we could see it extending into the interior, winding in long opaque sinuosities between the hills until lost to sight in the distance.

I observed here the same peculiarity which we noticed on the floes, on a sunny day, whilst sledging in 1876, namely, the bright iridescent colours caused by the sun's rays reflected on the surface crystals, although the colouring on the glacier was not near so brilliant and so beautiful as that on the floes. I also observed, in several places, little heaps of black earth, which had apparently been squeezed up by the enormous pressure exerted by this frozen river, as it gradually flowed onwards towards the sea. From observations made in this bay, I came to the conclusion that the proximity of discharging glaciers was inimical to the presence of organic life at the bottom. I arrived at this opinion from the examination of the stomachs of some seals shot in the bay, and also from the poor results of my dredgings.

The following morning we weighed, and with a fair fresh breeze made rapid progress to the northward. The next morning Admiralty Peninsula was passed, and sailing on between Berg Island and the mainland we reached the northern extreme of the western Pankratjeff Island, where, as agreed with Captain de Bruyne, a cairn was erected, and a record deposited detailing our movements so far, and proclaiming our further intentions.

There appeared to be little alteration in the aspect of the country since our visit some weeks before, except perhaps there was less snow, for although there was little, if any, lying in the valleys, the summits of the hills still preserved their white covering. No ice was to be seen in any direction.

Whilst employed constructing the cairn we sighted the *Willem Barents* to the north-west, but at too great a distance to afford us the opportunity of communicating.

The next morning we rounded Cape Nassau, but whilst attempting to get into Russia Bay, a furious gale from the south-east sprang up, compelling us to lay-to under very reduced canvas.

On the 30th of August we succeeded in finding shelter under the lee of the Barents Islands, and the next day, the wind having moderated, we landed in order to examine the depôt of provisions established on one of these islands by the Austro-Hungarian Expedition in 1872. Although we made a very careful and diligent search for the "*cache*," it was quite unsuccessful; no signs, or any indications whatever, could we find of the depôt.

A westerly gale necessitated a speedy departure, and after a couple of hours' rapid run we found good anchorage in Russia Bay.

During our stay in this harbour it blew so furiously from the south-west that for three days it was quite impossible to leave the ship in order to explore the coast. On the 1st of September it blew with great violence, accompanied by a heavy snowstorm. Such was the fury of the gale that we dared hardly venture on deck. Although anchored within 200 yards of the shore, the land was invisible during the whole day, and everything on our upper deck was completely buried under the snow. The barometer during these gales was unusually low.

Taking advantage of a moderately fine day, we again got under weigh on the 5th of September, and shaped our course northwards. The scenery of this part of Novaya Zemlya is very grand, and is made all the more so from the number of large glaciers that extend along the coast. The hills appear to be from 1000 to 2000 feet in height.

During the day we passed through several light streams of fresh-water ice, the fragments and débris that are constantly falling from the faces of the glaciers. At first these streams were mistaken for the outlying portions of the pack; but, on approaching, the nature of the ice was unmistakable. Fresh-water ice is always much more transparent, and, when not of a blue colour, is darker than salt-water ice, sometimes almost black. Salt-water ice is rarely if ever seen without a covering of snow, except in a very advanced state of decay. At a distance an accumulation of this glacier ice will not unfrequently be mistaken as an indication of the proximity of the pack, and it is only by a close inspection that the real character of it will be detected.

On the 6th of September we passed Ice Cape, and at noon the same day landed and constructed a cairn on one of the Orange Islands, leaving a record for the Dutch. We thus had the honour of carrying the British flag, for the first time, to the northward of Novaya Zemlya.

The Orange Islands are two in number, besides numerous rocks. They are not more than half a mile in length each, by a few hundred yards in breadth, and about 100 feet above the level of the sea. The sides are nearly precipitous, but the summits are flat. They are of limestone formation, and, unlike the Barents and other islands on the north-west coast, the limestone is unfossiliferous.

As there was every chance of our being able to reach Ice Haven, a course was steered, very much against the inclination of our crew, for that interesting spot. The next morning, however, meeting with a few loose streams of ice, the men positively refused to proceed in the required direction. Ice Haven had to be given up, and a course was shaped to the north-west in order that we might examine the edge of the pack from east to west. The reason that our crew exhibited so much timidity, or perhaps I had better call it by the milder term of prudence, was that they were afraid of the Kara Sea ice closing in upon the north-east point of the island, and thus cutting off our retreat. I am of opinion, however, that the Kara Sea pack was well to the southward, and that a vessel would have had little or no difficulty in reaching a high latitude to the north-east.

The furthest point reached by us was off the old Vlissinger Hooft of the Dutch, within about 30 miles of Barents' winter quarters. There was no ice, so far as we could see, along the coast from Cape Mauritius southwards, and only a few loose streams to the eastward about 10 miles off the land.

The aspect of the country south of Cape Mauritius is very similar to that on the east coast south of the Matyushin Shar—a low, undulating, and uninteresting-looking land. The noble hills and stately glaciers of the west coast cease at Ice Cape. I was told that glaciers exist south of Ice Haven, but was not in a position to verify the statement.

About 25 miles north-west of the Orange Islands we passed through some loose streams of ice, in some instances closely packed, compelling us to alter course in order to get round the projecting points. As we went to the westward the ice appeared to get lighter, until on the evening of the 7th we lost it altogether.

On the afternoon of the 8th we again sighted the *Willem Barents* standing to the south-west, we, at the time, steering a north-west course. It was blowing too hard to effect communication. Had we done so, we should have heard the pleasing news that she had reached Franz-Josef Land the previous day.

Having accomplished their original intention of placing the memorial stone on Cape Nassau on the 29th of August, the Dutch explorers attempted to reach the Pankratjeff Islands in order to leave a record, as agreed between Captain de Bruyne and myself; but a furious gale of wind (the same we experienced a little further north) prevented this design from being carried out. They then steered north, with the intention of examining the edge of the pack between the 50th and 60th meridians of longitude. In latitude 78°

they met a few loose streams of ice, but to the eastward there was plenty of open water. To the west, as we found to our cost, was pack ice. After proceeding a few miles, they lost sight of the ice altogether, and saw only a few icebergs. On the 7th of September, at 6 P.M., they sighted Franz-Josef Land, extending from N.E. ½ E. to N.W. ½ N. The ice was still round M'Clintock Island, and they were only able to approach within about 16 miles from the ice that surrounded it. The weather being threatening, and knowing that there was a good deal of ice to the northward of Novaya Zemlya, it was deemed advisable to return at once, so that no opportunity offered for landing and exploring this interesting country.

On the same evening that we saw the *Willem Barents*, having reached the latitude of 78° 8′, a strong northerly gale came on, which obliged us to lay-to for nearly twenty-four hours, during which time we were blown and drifted a long way to the southward. The heavy sea that accompanied this gale was a very sure proof that the pack was a long way off.

A fair wind on the 11th enabled us to regain a little of our lost ground, and on the afternoon of the following day, being in the 47th meridian of longitude, we sighted ice in latitude 78°.

Fragments of fresh-water ice were first observed, to some of which the *soil was still adhering*. This, to me, appeared a sure sign that the land could not be far distant, whilst their irregular and angular-shaped sides was another convincing proof. When small pieces of ice have been subjected for any length of time to the action of the sea, they become water-worn and lose their irregularity of outline.

This belief on my part of the proximity of land was further strengthened by the increased number of birds of various sorts that flew around us. Kittiwakes innumerable and Fulmar petrels soared over our heads, whilst ivory gulls, dovekies, rotges, guillemots, skuas, and the Glaucus gull hovered around us. The guillemots were flying in small flocks of from six to twelve in each, which, in itself, was a sure indication that we were in the neighbourhood of loomeries; whilst the presence of the smaller birds, some of which are rarely seen any distance out at sea, was in itself a sign of the proximity of some land.

Determined to remove all doubts, a course due north was shaped. But as we proceeded, the streams of ice became more numerous, and we began to experience a little trouble in threading our way through. To add to our difficulties, the weather, which in the morning had been fine and clear, grew thick and threatening, and before noon we were enveloped in a dense fog. This was most aggravating, for we almost believed, if it had been a clear day, we should have been able to sight the land. However, we still persisted in a northerly course until 3 P.M., when the ice getting gradually more closely packed, and no appearance of the fog clearing, we very reluctantly came to the conclusion that it would be imprudent to persevere any longer in such thick weather, and the ship's head was turned to the southward. We had then sailed about 25 miles into the ice, that is to say, that for five-and-twenty miles we had sailed in a northerly direction through loose streams of ice. Our highest latitude, by account, was 78° 24'. This position was six miles further north than that attained by the Dutch expedition last year, but fell short, by 14 miles, of the latitude reached by Weyprecht and Payer in 1871.

Although the ice was getting more packed as we advanced, I am of opinion that a steamer would have experienced no difficulty in getting through, for a ship provided with steam power is able to push on when it would be extremely rash for a sailing vessel to attempt to do so. The chances of a calm, of a change of wind, or the ice closing in astern must never, in the latter case, be lost sight of, more especially at such a late season of the year as the middle of September. We saw no floes of any kind, or indeed any piece of ice which, by the most imaginative person, could be magnified into a floe!

The ice appeared to be of two descriptions mixed up indiscriminately with each other; a few heavy pieces of from 8 to 12 feet in thickness, the remainder of a much lighter character, apparently only of one season's formation. According to the chart, the position we reached was about 80 geographical miles from the land sighted by Payer, but as that explorer only saw this land from the eastward, I am inclined to think that it extends in a south-west direction, and that we were therefore much nearer land than we were aware of.

This virtually ended our cruise in the little *Isbjorn*. The season was already advanced, the nights were getting dark and long, and with an unwilling crew it was hopeless expecting to do more. Had we known of the success of the Dutch we should, undoubtedly, have made another attempt to push north further to the eastward, but we naturally thought that the ice we met extended pretty nearly in the same latitude to the east and to the west. The cruise of the *Willem Barents*, however, is quite sufficient to prove the accessibility of Franz-Josef Land, except in extraordinary years like 1872. I am, most decidedly, of the same opinion as Payer, that the latitude of 78° can, in all probability, be reached every year, provided a vessel remains out late enough in the season. I also agree with him that the ice in the Barents Sea is at its minimum during the month of September; therefore, in spite of long nights, that should be the month selected for a dash northwards. But with a sailing ship it would be highly injudicious to carry on the work of exploration in the ice, beyond the 15th of that month. During our last days in high latitudes, the temperature was never above freezing point at any time for eight days, our rigging was coated with frost rime, and our ropes were frozen hard. Although the cruise of the *Isbjorn* was undertaken with sport as the main object, still the result of the voyage forms a link in a very important chain of evidence which goes conclusively to prove that Franz-Josef Land is not so difficult of approach as has heretofore been considered, and the thanks of all geographers are due to our Associate, Sir Henry Gore-Booth, for having forged that link. As it is not probable that the British Government will, for some time at any rate, interest itself in the glorious work of Arctic exploration, it remains only for private individuals, men like Allen Young, Leigh Smith, and Gore-Booth to follow the good example set them by that munificent gentleman, Mr. Oscar Dickson of Gottenburg, who, by the late brilliant geographical success achieved by Nordenskiöld, has reaped the reward of patient perseverance.

It is only by perseverance that success can be commanded in the Arctic Seas. I would now propose that a vessel, and one is quite sufficient, should be sent out to Franz-Josef Land, prepared to winter. Should the season be unfavourable, and the vessel be unable to reach her destination, the commander ought to be instructed to return to England, and be sent out the following year. But from a comparison of all the voyages which I have enumerated in this paper, I am inclined to think that a steamer would have no difficulty in reaching the south coast of Franz-Josef Land during the last week in August, or during the first two weeks in September. It is not for me to say what success will be achieved if a vessel is once able to establish herself in winter quarters on the west coast of Zichy Land. Suffice it to say, that a very large tract of hitherto quite unknown land would be explored, and a great deal of useful and important scientific information obtained. I sincerely trust that the brilliant successes achieved this year by the Swedes and the Dutch, will inspire English gentlemen and those interested in Arctic exploration to uphold the honour of our flag in those regions where it has hitherto always been displayed in the van.

In addition to our natural history collection, a great many soundings were obtained in the Kara and Barents Seas, serial temperatures were taken, and dredgings collected.

On the termination of the paper the following discussion took place:—

The PRESIDENT said the Council had hoped to have had the pleasure of seeing present at the meeting Captain De Bruyne, who commanded the *Willem Barents*, but he had unfortunately not been able to attend. The Netherlands Minister, Count Bylandt, however, had again done them the honour of attending, thereby showing the interest he took in the proceedings of the Society, and his desire to make more evident the cordiality that existed between the explorers of the two nations. Englishmen claimed for themselves the credit of being the discoverers of Novaya Zemlya, through Sir Hugh Willoughby, more than three hundred years ago. Since that time English, Dutch, Swedes, and Russians, had engaged in friendly rivalry in those seas, and he was sure the Meeting would listen with interest to any observations which Count Bylandt might make.

Count BYLANDT said, in addressing a few words to the Meeting on the subject of the paper, he was sorry to have to begin by announcing the sad intelligence that reached him a few days ago of the untimely death of one of his countrymen, Lieutenant Koolemans Beynen, whose name as connected with Arctic exploration was not unknown to the Society. He was quite sure that all who had known him, and especially Sir Allen Young, would agree that he was a most promising young officer, full of pluck and spirit, always putting his whole heart and soul into the work before him. The best way in which his country could show honour to his memory would be by continuing his work; and after listening to the paper which had just been read, he thought it might be fairly expected that such would be the case. No doubt the Society would be interested in hearing what was the real impulse which had revived the spirit of Arctic exploration among his countrymen, after that spirit had slumbered for nearly three centuries. They would be pleased to hear that England was connected with it. After his arrival in England in 1871, he happened to hear that an English gentleman, Mr. Lister Kay, had just returned from a yachting trip to Norway, where he had met the Norwegian Captain Carlsen, who had returned from a cruise round Novaya Zemlya, where he had found the hut in which Barents and his crew passed the winter of 1596–7, and many interesting relics belonging to those gallant navigators. Mr. Lister Kay decided at any price to buy the whole collection, expecting that it would be repurchased from him for one of the English museums. In this, however, he was disappointed, so that the collection remained on his hands. As soon as he (Count Bylandt) heard of it, he wrote to his Government on the subject, and received instructions to enter into negotiations with Mr. Kay in order to secure the collection. He therefore called upon that gentleman in Dorsetshire, and saw the relics, which consisted of an old Dutch clock, the bell of the ship, candlesticks, spoons, knives, forks, a map, and two or three books, which were in a remarkable state of preservation, notwithstanding they had been buried under the snow for 275 years. Mr. Lister Kay, in the most gentlemanlike manner, said that if the collection could not remain in England, Holland had the next claim to it, and not wishing to make any profit out of it, he was quite ready to sell it to the Dutch Government for the same price he paid for it. The purchase was made, and the whole collection was now to be seen in one of the museums in the Hague. Another English gentleman, Mr. C. Gardiner, owner of the *Glowworm*, also made a trip round Novaya Zemlya, and found other relics, which he most generously presented to the Netherlands Government, so that now the collection was complete. Unfortunately, according to the existing regulations in this country, it was not possible to confer upon Mr. Gardiner the knighthood of the Order of the Netherlands Lion, but it was decided to have struck for him a solid gold medal of large size, which he (Count Bylandt) had the honour and pleasure of presenting to him. The medal was the more valuable, because only two copies of it existed in the world, namely, one in the possession of Mr. C. Gardiner, and the other in the Numismatic Collection of the Netherlands Government. These two circumstances, and the publication of a book by an American gentleman of Dutch origin, Mr. Van Campen, whose name was not entirely unknown to the Society, were the cause of the revival of the spirit of Arctic enterprise in the Netherlands. Lieutenant Koolemans Beynen requested the favour of joining Sir Allen Young in the *Pandora*, and when he returned from that expedition he could not rest until he had induced his countrymen to send out the *Willem Barents* on a national expedition. He wished to mention also that the British Government had kindly lent to that expedition some instruments which had been used on board of the *Challenger*. This fact was a new proof of the friendly assistance and co-operation which the British Government manifested to the Netherlands Government on every occasion when it could possibly be granted. Lieutenant Koolemans Beynen was very sorry he could not take part in the expedition of the *Discovery* and the *Alert*, under Captain Sir George Nares.

The PRESIDENT said there were some distinguished naval officers present who had taken part in Arctic explorations, but before they expressed their opinions as to the results of the two cruises which had been described in the paper, he was sure the Meeting would like to hear a few words from Sir Henry Gore-Booth, who was the promoter of the voyage in which Captain Markham had taken part. Captain Markham had not stated the circumstances under which he joined in the cruise, but it appeared that Sir Henry Gore-Booth was on the point of starting when his intended companion failed him. Lady Gore-Booth very properly refused to allow him to go alone, and he therefore came to London in hopes of finding some one who would share in the trip. Naturally enough he went to see their Honorary Secretary, Mr. Clements Markham, to ask him if he knew of anyone who would join him. Mr. Clements Markham happened not to be at home, but Sir Henry Gore-Booth heard that his cousin, Captain Markham, was in the house. He told him of the difficulty under which he laboured, and Captain Markham said he would endeavour to find him a companion, but if he failed to do so he would go himself. The upshot was that at a very few days' notice he started on the trip. This gave an additional interest to the paper, and the spirit shown by Captain Markham proved that British sailors were ready under any circumstances to go on any voyage of adventure that was presented to them.

Sir HENRY GORE-BOOTH said he feared that as a sporting trip the voyage was a failure, but if it had assisted in any way towards furthering the objects of the Society, he was fully rewarded for the expense and trouble to which he had been put. Captain Markham had given such a good account of the state of the ice, and of the theories in which they were agreed, that nothing remained for him to do but to state that he quite concurred with everything that had been stated in the paper. He was extremely lucky in securing the companionship of Captain Markham. On a Saturday, at four o'clock, he found that he had no one to accompany him on the trip, but by Sunday morning Captain Markham had given him his answer that he would go with him, provided he could obtain leave from the Admiralty. Fortunately the leave was not refused, and if he had to take another trip he would rather have Captain Markham as his companion than anyone else he knew. A more cheery companion there could not be, or a more energetic collector of specimens of all descriptions—nothing came amiss to his net. He could not allow the present occasion to pass without expressing his thanks to Captain De Bruyne and the officers of the *Willem Barents* for the kindness they showed in the Matotschkin Shar, where the stores of that ship were placed entirely at the command of himself and Captain Markham. He wished to conclude by heartily congratulating the officers of the *Willem Barents* on their success, and he hoped they would next year again visit the Arctic regions and be equally successful.

Admiral Sir LEOPOLD M'CLINTOCK said it afforded him very great pleasure to have this opportunity of expressing the extreme gratification he felt at this addition to Arctic geography. Of course all geographers were delighted at any increase to their knowledge, but more particularly were Arctic geographers pleased with any fresh discoveries in the Polar regions. By merely listening to a paper on the subject, it was scarcely possible to realise the difficulties that had been overcome, more especially when they were accustomed to hear of our own large expeditions fitted out with every possible appliance. If it were borne in mind that Sir Henry Gore-Booth's vessel was only 50 feet long and 17 feet wide, without steam, and that such a little vessel was absolutely helpless whenever there was more than a film of ice on the water, it would be more readily understood how greatly they were indebted to Sir Henry Gore-Booth and Captain Markham for their exertions. Gentlemen who went out in this way and spent time, energy, and means to accomplish such ends, conferred a great obligation on the geographical world, and it was the duty of the Royal Geographical Society to support in every way such patriotic achievements. Allusion had repeatedly been made in the paper to the Dutch Expedition. He understood that that expedition was a semi-official one, and had been very carefully considered. The object was to make a patient, systematic, and scientific examination of certain portions of the unknown Polar area, in order to ascertain the temperature of the sea, its depths, the movements of the Arctic waters and ice, and some information as to Arctic meteorology. Nothing could assist the advance of Polar geographical knowledge more than this patient and systematic examination of its sea-bed, and all English geographers would rejoice at the success which, notwithstanding their very limited means, had attended the Dutch Expedition. They would also sympathise in the loss of Lieutenant Beynen. Many who were now present would remember seeing him in that hall on the return of the *Pandora*. He was a most promising officer, and was trained in Arctic service under Sir Allen Young, who was a most skilful, accomplished, and successful Arctic explorer. Great expectations had been formed of his future, and English geographers would feel that they also had suffered a severe loss, and enter most heartily into the feelings of the Dutch naval officers and the Dutch people.

Sir GEORGE NARES said it struck him that the yachting cruise which Sir Henry Gore-Booth and Captain Markham had undertaken, would be most useful in adding to our knowledge of those seas, in which lies the proposed commercial route to the Obi and Yenisei. Following up the track of Captain Wiggins in 1874, and Professor Nordenskiöld in 1876, an attempt had been made during the present year by half-a-dozen steamers from England to get into the Kara Sea, but it had not met with success. There could be no doubt that a large commerce might be opened up with that sea, but the present year had been a bad one. A Russian steamer, the *Louise*, he believed had got through, and had returned from the Yenisei with a cargo. On the 21st of September, Captain Markham had told them that the ice in the Kara Sea was 30 feet thick, and it was a totally different ice from that which whalers passed in Baffin Bay. Therefore the merchants who tried to penetrate through the Kara Sea must not send out little steamers which were only adapted for reaching St. Petersburg and the Baltic, though the idea in the early spring of this year was that such steamers might make the voyage. No doubt the merchants who had suffered pecuniary loss this year would profit by the lesson, and the Kara Sea would be ultimately opened up to commerce. In the other voyage that had been spoken of, that of the *Willem Barents*, Captain De Bruyne had evidently been most fortunate, for the Austrian vessel, the *Tegetthoff*, was simply drifted to Franz-Josef Land. The present year, however, had been very favourable in that direction, though unfavourable as regards the Kara Sea. It all depended upon the wind. If the little *Willem Barents*, a sailing ship, could get very near Franz-Josef Land, a steamer could in all probability reach that land. The great advantage of Franz-Josef Land was that the investigation of the coast would not only afford information about the Polar Sea, but might point out the best route to the Pole. He was not one of those who wanted merely to get to the Pole. The whole Polar area should be scientifically explored. Captain Markham stated that the great desiderata in Arctic exploration were perseverance and caution. There must be caution. A steamer in making for Franz-Josef Land left the land behind it, and must necessarily pass through a pack as broad as that which cut off the whalers in Baffin Bay from the north-water. If they could once catch the land again they might go on. He (Sir G. Nares) would like to obtain more knowledge about the north-east end of Spitzbergen. It was known that Franz-Josef Land extended considerably in that direction, and perhaps they could get nearer to Franz-Josef Land from the north-east coast of Spitzbergen than from Novaya Zemlya.

Admiral R. Vesey Hamilton had listened to the paper with great pleasure. Admiration had often been expressed with regard to the wonderful work done by the old Arctic navigators three hundred years ago in very small vessels, and well it deserved to be so spoken of; but there was not such a great contrast between life on board those vessels and life at home as there would be now. Gentlemen at home at ease did not live so pleasantly then as now, and when they went abroad their style of living was not much altered. Sir H. Gore-Booth and Captain Markham had made their voyage in quite as small a vessel as the old navigators used, yet they had achieved good results. Few men would like to be cooped up with another person and a dog in a cabin 5 feet 9 inches by 5 feet 6 inches for several months. It appeared to him they had made one mistake. Although they had a plentiful supply of warm clothes, they had taken with them also very wet blankets in the shape o. the harpooners, whose sole function appeared to be to inspire the crew with too much prudence. Prudence required to be allied to dash in Arctic navigation, and in any future explorations of this sort he hoped there would be more icemen who would follow the example of Leigh Smith and others. If experienced icemen could not be obtained to enter heart and soul into the feelings of the commander, they had better be left behind, and confidence placed in the energy of an English crew. Of course he did not know but that some excuse might be made for the poor Norwegians who were under two Englishmen into whose feelings they could not enter; but if such men as Captain Adams, Captain David Gray, and Captain Wiggins of Sunderland could be obtained, who would enter heart and soul into the work, great success would be attained.

Captain Feilden congratulated the author of the paper and Sir H. Gore-Booth on bringing to a successful conclusion what must be regarded as a somewhat hazardous expedition. Captain Markham had described in very modest terms the surroundings of their little craft when it reached its most northern point, but of course many now present knew what crossing the 78th parallel in the middle of September meant. The author had said that the nights were then getting long and dark. Undoubtedly that was so, for just four weeks later, about October 15th, the sun would disappear below the horizon altogether in that latitude. Captain Markham also mentioned that for eight days the temperature was never above freezing point, that the decks were covered with snow, and the ropes frozen hard. It was therefore something more than a mere yachting cruise, and he was not surprised that the Norwegian crew showed themselves to be "prudent" men, and Sir H. Gore-Booth and Captain Markham in his estimation would have shown themselves very imprudent men if they had remained in that high latitude any longer in such a vessel. However it was a proof, as Admiral Hamilton had said, that British yachtsmen of the present day had in no way deteriorated from their forefathers who first pushed their vessels into those tempestuous, ice-encumbered seas. It was a matter of congratulation to those who in that hall twelve months ago advocated the route by Franz-Josef Land, to find that by the voyages of the *Willem Barents* and the *Isbjorn* their predictions had been verified to the letter, so that there now seemed every prospect of a route towards the Pole being found by Franz-Josef Land. In latitude 83° Payer saw a precipitous mountainous land stretching away to the north, while at the same latitude in Grinnell Land it came to an abrupt end. He had very little to say in regard to the natural history collections beyond that when Captain Markham returned he assisted him in distributing them amongst various specialists, who would describe them in due course. With the means at his disposal Captain Markham could not make a very large collection, but it was a general and extremely interesting one, and the method of distribution he had adopted with regard to it would ensure its being made available in the cause of science.

Mr. Etheridge said, on his return Captain Markham had requested him to examine his geological collection, knowing that he had done the same with the collection brought home by Sir George Nares. Specimens had been brought home by Captain Markham from thirteen or fourteen localities in Novaya Zemlya. Three of those were extremely rich in carboniferous fossils, and curiously enough they agreed almost species by species with those obtained by Sir George Nares and Captain Feilden, at Cape Joseph Henry in latitude 82° 45′. The value of such specimens was greatly enhanced when they could thus be correlated with others from different regions. The result was that it might now be safely affirmed that the greater portion of the Polar region was composed of carboniferous rocks, and that the greater part of the Polar Sea north of Franz-Josef Land and Spitzbergen probably covered a large area of coal measures. The connection of Spitzbergen with the great range of the Ural Mountains could now be shown, and the beds found there could be correlated with the beds in Baffin Bay and Grinnell Land, so that a distinct belt of carboniferous and Devonian rocks circled much of the Polar region. It was in consequence of these expeditions and the collections brought back by them, that we were enabled now to draw up general geological maps of the world. The eastern extremity of the carboniferous rocks in the Polar area could now be mapped out with as much certainty as the Pennine chain or any part of the centre of England. This was the real and ultimate philosophy of all geological explorations—to be able to put one's finger on certain points on the globe, and say "This or that is composed of such and such a group of rocks." It was in this way that the great maps of Marcou, Sir Roderick Murchison, Dumont, and other eminent geologists, were made, not only by personal examination of the places, but by examining collections that had been brought home by explorers. It was interesting to know that from Berg Island Captain Markham brought home thirty species of carboniferous fossils, every one of which could be matched in the Pennine chain in Derbyshire and Yorkshire, and the same might be said of the collections of Von Keyserling in Petchora Land in Northern Russia. From Barents Island we have, I think, fourteen or fifteen species, and we now know that the northern extremity of Novaya Zemlya is composed entirely of carboniferous rocks, which dip beneath the sea under Franz-Josef Land towards the Pole. He wondered how Captain Markham had been able to obtain the specimens, for those from the other ten localities were made up of metamorphic rocks, gneiss, clay-slate, &c., which were inorganic. The identification of these fossils, however, was so complete and certain that the history of these northern rocks now began to be perfectly well known.

GEOGRAPHICAL NOTES.

The Outlet of Lake Tanganyika.—The much-debated question of the outflow of Lake Tanganyika is at length settled. We have received a letter from Mr. E. C. Hore, of the London Missionary Society's station at Kawele near Ujiji, informing us that he visited the Lukuga last rainy season and found it a large and very swift river flowing out of the great lake. He descended the stream in a canoe as far as the reedy barrier, the "Mitwansi," described by Stanley, and found it had been swept away. From the summit of the Kijanga ridge on the banks he saw the river flowing westward as far as the eye could reach, in the direction of the Lualaba. Mr. Hore's letter is dated May 27th last, apparently about a month after his visit, as he mentions that the rains were then over, and that the waters of Tanganyika had sunk 24 inches in the previous twenty-eight days. Cameron visited the Lukuga in May, Stanley in July; both in the dry season.

Return of the Portuguese African Expedition.—Messrs. Capello and Ivens, the members of the Portuguese expedition who turned northwards, as previously recorded (vol. i. p. 330), before the departure of their colleague Major Serpa Pinto on his southward journey, returned to Loanda in November, and are now on their way to Europe. They have been occupied in surveying and drawing up a general map of the region adjoining the Portuguese settlements. The hostility of the natives prevented them from carrying out their intention of descending the Quango to its junction with the Congo, and they were forbidden by the Muata Yanvo from visiting the eastern part of his dominions, although in other respects they were favourably treated by this potentate. In a geographical point of view the region of the middle and lower Quango, which they explored, especially the great forest belt between the 5th and 7th parallels of latitude, will no doubt prove the newest and most interesting. The two explorers were well provided with instruments not only for survey, but for meteorological and magnetic observations, and a rich harvest of scientific information is expected as the result of their labours.

The Sources of the Niger.—Further details of the geographical feat of MM. Zweifel and Moustier have been published in the French journals during the past month. We gather from them that the expedition, comprising guides, interpreters, and upwards of fifty porters, and well furnished with supplies, started on its journey from Port Loko, on the northern branch of the Sierra Leone River, on the 11th of July last, arriving at Big-Boumba, capital of the Limbah country, on the 25th of the same month, and at Falaba on the 16th of August. In their march, the party followed a route a little to the south of that taken by Mr. Winwood Reade, intending to proceed direct from Sagala to Mount

Loma, at the northern foot of which the sources were reported to lie, but like their predecessors they eventually found it necessary to proceed first to Falaba. Their plans here were favoured by an unexpected political event, viz. the arrival of a party of Koranko warriors from Mount Loma, with the object of establishing an alliance with their habitual enemies of Falaba. The proposals of these emissaries were accepted, and the alliance celebrated by a festival on a large scale, on the termination of which the king of Falaba gave the travellers a guide, and allowed them to join the envoys from Mount Loma on their return journey. Letters despatched by the travellers from the Koranko country, dated respectively September 12th and October 3rd, announce that they had crossed several branches of the Niger, and discovered the principal head stream. A war lower down appears to have prevented their following these smaller streams to the Joliba or main Niger.

French Explorations in West Africa.—The Minister of Marine at Paris has directed the Governor of French West Africa to despatch an exploring expedition into the tract of country lying between the upper waters of the Senegal River and the Joliba or Upper Niger. It is intended that they should examine this region with the view of ascertaining whether a railway can be constructed between the two rivers. M. Houet has been attached to the expedition as draughtsman. A scientific mission, under M. Carré, a French engineer, is also reported to have started from St. Louis early in October for Médine and Bafulabé.

The London Missionary Society's Second Expedition to Lake Tanganyika.—In our last note respecting the progress of this expedition (vol. i. p. 788) we summarised the intelligence received from Messrs. Southon and Griffith down to their arrival at Lagula, in Northern Ugogo, early in August. In their next letters they report that they left Lagula on August 7th, their first halting-place being Unanguira, the centre of a district with a population of about 30,000. Passing Muhalala, they arrived in four days at Koi Kirondah, on the usual road to Uyui and Unyanyombe. The hitherto unexplored route which the party followed from Mpwapwa to Koi Kirondah is stated to be 194 miles long, and was traversed in twenty-four days. The expedition started again on August 15th, and reached Uyui in ten days, five days' further march bringing them on August 30th to Urambo, Mirambo's capital. Dr. Southon reports that this place, which the natives call the *Kwikuru*, is a large square enclosure, the sides of which are composed of a substantially built wall, against which houses are built all round; it is about half a mile square, and in the space thus enclosed some two hundred round huts—well built, and some of them 50 feet in diameter—afford accommodation to about 10,000 people, while fully 5000 more live in the houses built against the wall. There are many villages of various sizes close to the *Kwikuru*, which contain a large number of inhabitants, and make up the locality called Urambo. The further instalment of his journal, which Dr. Southon has sent home, contains some interesting information respecting the manners, customs, and dress of the Wagogo.

The Algerian Missionary Society's Expeditions to the Lake District of Equatorial Africa.—Mgr. Lavigerie, Archbishop of Algiers, has lately received from the missionaries, composing the two expeditions referred to on p. 453 of our last volume, detailed accounts of their respective journeys from Tabora to Lakes Tanganyika and Victoria. Great delay appears to have occurred in the receipt of their letters and journals, as the first are dated early in November 1878.—News has also reached Mgr. Lavigerie from the second expedition, mentioned on p. 454, which left Algiers in May and June of last year, and entered Ugogo at the end of September. Their caravan consisted of about six hundred porters, and they had with them a number of donkeys, purchased at Zanzibar, as well as six mules which had been sent from Algiers as an experiment, in order to ascertain how far these animals were suited for the climate of Equatorial Africa. The mules are described as having arrived at Mpwapwa in a pitiable condition, and appear to be quite unsuited for transporting burdens along the paths which form the only roads through the tall grass, jungle, and forests of East Africa. The animals were apparently engaged in a constant endeavour to disentangle themselves and their burdens from the brambles, &c., which caught them first on one side and then on the other of the narrow winding pathways. The Europeans of the party—sixteen in number—also arrived at Mpwapwa in an enfeebled state of health, having suffered severely from fever and want of proper food, but they met with no special difficulties on the road from Bagamoyo, for the rivers, which in the rainy season transform the country into a vast marsh, were then mere streamlets. The missionaries do not appear to think very highly of the climate of Mpwapwa, but they write in terms of the warmest gratitude of the disinterested kindness of the members of the Church Missionary Society's station there. The members of the expedition, we learn, remained for three weeks at Mpwapwa to recruit themselves before prosecuting their journey into the interior.—Though the main object of the Algerian missionaries is, of course, a religious one, it is gratifying to find that the interests of science are not overlooked. Before their departure for Zanzibar, two members of the second expedition—Pères Ruellan and Moncet—were sent by their superiors to Paris, in order that they might learn at the Muséum d'Histoire Naturelle and the Monsouris Observatory how to avail themselves of the opportunities for making geographical and other scientific observations which they would have in their distant field of labour. Père Ruellan writes that, with this object in view, his first care on arrival in camp has always been to determine its geographical position, and that he has carefully measured the distance from Bagamoyo to Mpwapwa, and finds it to be as nearly as possible

205 miles (330 kilomètres). On the arrival of the expedition at Tabora, he hopes to get his photographic apparatus in order, and to be able to send home faithful representations of the extraordinary types of the negro race which are met with every day.

The Church Missionary Society's Nyanza Expedition.—Among the letters and journals lately received by the Church Missionary Society from their Nyanza Expedition, we find several extracts from the correspondence of Mr. Felkin, one of the party sent by way of the Nile, who reached Rubaga, Mtesa's capital, on February 14th of last year, rather more than nine months after leaving England. Some two months after his arrival, Mtesa gave permission for him and Mr. Stokes, who had arrived from the south (vol. i. p. 590) with Mr. Copplestone on April 9th, to make a walking tour eastwards to the Ripon Falls, where the Nile issues from the Victoria Nyanza. They accordingly left Rubaga on April 22nd, and soon afterwards Mr. Felkin saw the waters of the lake, being thus the first Englishman who has seen both Lake Victoria and Lake Albert, and the second European,—Dr. Emin Effendi being the first. On the 23rd they had a long march, and one part of the journey Mr. Felkin says he shall never forget. They went down into a steep valley, nearly dark overhead, closed in with huge trees, at the bottom a knee-deep stream flowing rapidly along, and birds flying screaming about; the whole scene recalled the stories of fairy-haunted spots. Afterwards a distant view was obtained of the Nile flowing along to the north, but hills hid the lake and falls from view. Being told by the people that it would take four days more to reach the falls, Mr. Felkin was obliged to turn back, as he had promised Mtesa to return in a week. Mr. Stokes, however, persevered, and after visiting the falls returned to Rubaga on May 4th.

Lake Nyassa.—Mr. James Stewart, C.E., to whom we were indebted for the route-survey of the western side of Lake Nyassa, published in our last volume (p. 352), in illustration of Dr. Laws' paper, has resigned his post in the Public Works Department of India, and has been permanently appointed a member of the Mission Staff at Livingstonia, where he has been serving as a volunteer for some time past. In the last letter which the Free Church of Scotland Mission Committee have received from him (dated August 11th), Mr. Stewart states that he was engaged in preparing for the exploration journey of the season. He proposed to start from Kaningina, and after visiting Mambelwa, the Mangone chief to the westward, to return to the lake near the northern end, and thence go to the Kambwé lagoon. In the beginning of October he was to march north-west to Lake Tanganyika, and expected to reach it in twenty days. He announces his intention of taking with him some extra stores, which were to be taken to the head of Lake Nyassa in the *Ilala*, in order that he might have it in his power to help the members of the London Missionary Society's first expedition, if he should meet any of them at or near Mbeté. Mr. Stewart did not expect to return to Nyassa till the end of November. He adds that Mr. Rhodes, who had just returned to Livingstonia from the Kambwé lagoon, gave a very favourable account of the people there, having found them hospitable and friendly. They gave him active help in sport, and offered to accompany him to Lake Tanganyika. Mr. Stewart is consequently hopeful that the way is open to make a peaceable and satisfactory examination of the country.

The Proposed American Missionary Expedition to Africa.—Mr. Asa Otis, of New London, Connecticut, having left them a legacy of upwards of 150,000*l.*, in March, 1879, the American Board of Commissioners for Foreign Missions deemed it incumbent upon them to consider whether, in applying this princely benefaction to missionary purposes, it would be possible for them to take part in the civilisation of the interior of Africa. In pursuance of this object, they despatched their Recording Secretary, the Rev. John O. Means, D.D., to Europe, to make inquiries and to gather information respecting possible fields of labour. As the result of his painstaking investigations, Dr. Means prepared an elaborate paper, entitled "The Proposed Mission in Central Africa," which was read at the annual meeting of the Board at Syracuse, N.Y., on October 8th, and which embodies a considerable amount of information respecting the interior of Africa. In considering where the new mission should be established, several regions were suggested as more or less suitable. These were as follows:—(1) the Upper Congo; (2) the Dana River and Mount Kenia; (3) the region north and west of the Albert Nyanza, among the Monbuttos and Niam-Niams; (4) the tract of country between Lakes Tanganyika and Nyassa, and thence to the westward; (5) the region about Mount Gorongoso, south of the Zambesi and near its mouth; (6) the Barotse Valley on the Upper Zambesi; (7) the tract of country on the Zambesi between 14° and 17° S. lat., recently conceded by the Portuguese Government to Senhor Paiva d'Andrada, and which extends from the confluence of the River Shiré to Nyampanga Island, near the mouth of the Kafue; and (8) the Bihé Plateau and the River Quanza in Western Africa. In recommending the last-named region, Dr. Means says:—"Bihé is a great caravan centre. The only route across the continent south of the Niger passes through Bihé; there the road branches off for Nyangwé, on the Upper Congo, for Muata Yanvo's kingdom of Ulunda and for Cazembe, Lakes Bangweolo, Tanganyika, and Nyassa, and for the Senna rivers, so called, on the Lower Zambesi and Mozambique. The climate of Bihé is said to be delightful; the elevation of four or five thousand feet moderates the tropical heats. The land is well-watered and fruitful. Some Portuguese blood has been mingled in the population, but in the main the tribes show all the marks of the Great Bantu family, which occupies the central region of the continent, and spreads through Zululand southward. The language is of the same Bantu family, though many Portuguese words have come in from the western, and Swahili words from the eastern, coasts, and these two languages suffice for travellers." In favour of this region Dr. Means urges certain considerations:—"(1) the healthiness of its climate; (2) the compactness of the kingdom under its chief; and (3) the facilities it would afford for reaching the interior of the continent. Moreover, the Bihé Plateau is easy of access from the coast, and if it should be determined upon as the site for the proposed mission, the preliminary explorations could be carried out at less cost, and the station formed in less time probably than elsewhere." Dr. Means' paper was referred to a special committee of the Board, which recommended the adoption of his suggestion and the continuance of the inquiries already set on foot with the understood purpose of establishing the mission proposed at the earliest practicable day.

The Climate of Central China.—As trustworthy meteorological statistics respecting localities in China are not often to be obtained, some interest attaches to the subjoined meteorological table for the port of Wuhu, on the Lower Yangtsze, for the year 1878, furnished by our Associate, Mr. E. L. Oxenham, Her Majesty's Acting Consul for that district, in his last report to the Foreign Office:—

	Thermometer.				Wind.	Rain.		Rise or Fall of River.	
	Maximum.	Minimum.	Average.			No. of Days.	No. of Inches.	Rise.	Fall.
			Maximum.	Minimum.					
								ft. in.	ft. in.
January	57	21	40	30	N. and N.E.	2	$1\frac{5}{8}$	..	1 11
February	54	28	45	38	N.E.	6	3	4 4	..
March	71	40	58	50	N.W. and E.N.E. ..	6	$1\frac{4}{8}$	2 11	..
April	83	44	60	53	E.N.E. and S.W. ..	18	$8\frac{1}{8}$	5 7	..
May	78	56	73	65	S.E. and S.W. ..	10	$8\frac{4}{8}$	2 8	..
June	87	60	80	73	S.S.E. and E.N.E. ..	6	$1\frac{7}{8}$	6 1	..
July	89	71	80	78	E.S.E. and W.S.W.	12	$14\frac{7}{8}$	4 5	..
August	90	69	82	79	Variable	7	$2\frac{6}{8}$	0 10	..
September ..	85	68	81	73	E. and E.N.E. ..	1	$1\frac{4}{8}$	..	2 5
October	92	45	68	61	E. and N.E.	15	$6\frac{7}{8}$	..	3 9
November ..	64	44	56	50	E. and N.E.	4	$3\frac{5}{8}$	..	2 3
December ..	58	23	46	39	N.E. and S.W. ..	8	$3\frac{7}{8}$	..	12 6

Annexed to this table are the subjoined notes respecting the weather during the same period:—

January	Fine and cloudy. Four days' snow.
February	Fine and cloudy. Two days' snow.
March	Ditto.
April	Cloudy and rain. River rose rapidly.

May	Cloudy and rain. River rose, but fell at end of month.
June	Fine and cloudy alternately. River low early in the month, rose at end of month.
July	Cloudy and rain. River rose very rapidly.
August	Fine, and light clouds. River stationary till end of month.
September	Fine.
October	Cloudy and rain.
November	Fine and cloudy.
December	Cloudy and rain. River fell very rapidly.

The Chinese Province of Shansi.—In a report which he has drawn up as Chairman of the Famine Relief-Committee in North China, Mr. R. J. Forrest, Her Majesty's Consul at Tientsin, furnishes some useful information in regard to the geography, &c., of Shansi, which from its richness in minerals, as pointed out by Baron Richthofen, promises at some future period to become one of the most important provinces in the Chinese Empire. Shansi extends from north to south about 400, and from east to west about 200 miles, and consists of two elevated valleys formed by the Yellow and Fen rivers, which are separated from each other and from the province of Chihli by desolate and formidable mountain ranges. The Great Wall intersects the province between 39° and 40° N. lat., and the industry of the people north of it is chiefly confined to the pasturage of animals, or the manufacture of ornaments from the agates and crystals which abound in the hills. Coal and iron are most plentiful all over the province, but more especially in the valleys stretching to the south; and the facility with which these minerals can be excavated caused the erection of extensive smelting works—now all cold—near the capital, Tai-yüan-fu, and thence along the entire valley of the River Fen. The population of Shansi has been variously estimated at from fifteen to fifty millions, but, basing his opinion on information obtained during the past few years, Mr. Forrest is of opinion that it did not exceed the former figure in 1874, and it is now, doubtless, much less. During the Ming dynasty the prosperity of the province was at its highest, and princes of that house had their favourite abodes near Tai-yüan-fu, but four centuries of neglect, famine, and insurrection have seriously interfered with the population, wealth, and fertility of Shansi.—Turning to the subject of disafforestation, which has probably gone to greater lengths in some parts of China than in most countries of the world, Mr. Forrest says that the mountains which intersect the entire province would suggest the existence of extensive forests, and as a consequence, a regular rainfall and an unfailing supply of water for agricultural purposes; but the ignorance of the people, or the apathy of their rulers, has permitted the hills to be shorn for centuries, not only of trees, but of that luxuriant herbage which, yearly quickening, yearly dying, should form, as in other provinces and countries, a sponge to retain the moisture necessary for the complete fertilisation of the country. A century and a half ago, it may be observed, Du Halde called attention to the fact that "coal, in either lumps or cakes, is used instead of wood, whereof there is not enough in the province for fuel." The "patches of earth" in the hills, mentioned by the same authority, "four or five feet in depth, without the least stone," may still exist in some places, but the greater portion of them have long since been carried down by summer floods to form shallows in the Yellow River, or dangerous banks at its mouth. —The rivers of Shansi are not now to any extent available as commercial routes, most of them, indeed, being of inconsiderable size. The Fen River, which flows by the capital and principal towns of the south of the province, carries the rainfall in a shallow and uncertain channel to the Yellow River, but its torrent-like propensities only admit of a small traffic. The natural inlet to Shansi is from the Yellow River, where the Fen joins it at Tung-kwan, and the magnitude and prosperity of the cities from that point northwards to Tai-yüan-fu are a sufficient indication that this was the great commercial highway in former times. The want, however, of engineering art, the powerlessness of the natives to deal with the caprices of the Yellow River, and other causes, have diverted the commerce of Shansi to Chihli, notwithstanding the enormous difficulties of access over the intervening mountains. The route lies through a rugged pass, known as the Ku-kwan, which commences at Hwai-lu-hsien, in Chihli, about 117 miles in a westerly direction from Pao-ting-fu, the provincial capital, and extends for 130 miles to Sze-tieh-hsien, some 29 miles from Tai-yüan-fu. Respecting this pass, Mr. Forrest cites the following observations by a traveller, the Rev. J. Lees, who was engaged in the distribution of relief among the famine-stricken Chinese in that region:—"Much of the road is along the dry bed of torrents, whose violence has impelled benevolent individuals to inscribe on the roads the timely warning against taking refuge from storms under ledges liable to be swept by sudden torrents—'Beware of the mountain water.' A route started ages ago has been in incessant use ever since, and a track has thus been worn by mere attrition. There is not the slightest approach to a grade. The traveller is often confronted by precipices hundreds of feet in height, and is seldom out of sight of apparently bottomless gullies. In the autumn and winter the valley roads generally follow the beds of streams, but what becomes of the roads, when the streams are full, is a standing puzzle to the traveller." Mr. Forrest does not appear to be very hopeful in regard to the condition of Shansi in the immediate future, for towards the conclusion of his report he remarks:—"No measures will be taken either to plant forests on the hills or to prevent the destruction of whatever trees remain. The Yellow River will continue unmanageable and unnavigable, and the Ku-kwan Pass, unaltered and unmended, will remain the great, if not the only, commercial route by which supplies can be conveyed into the province from the east."

Cocos or Keeling Islands.—We have received letters from more than one correspondent pointing out inaccuracies in Mr. Forbes' paper on the Keeling Islands,* relative to the identity of the Captain Ross, the first occupier and governor of the islands, and the discovery of the group. Mr. Forbes states that Captain Ross belonged to the Indian Navy, and one of our correspondents further identifies him with the Captain Daniel Ross, the well-known Hydrographer of the Indian Navy, and founder of the Bombay Geographical Society. Two quite different men are here confounded. Captain Ross, governor of the Keelings, was a merchant seaman, who settled on the island in 1825. He was succeeded by his son, Mr. J. C. (or G. C.) Ross, the host of Mr. Forbes during his recent visit. With regard to the discovery of the islands, the honour does not belong to the Ross family; they were discovered in 1608–9 by Captain William Keeling in the service of the East India Company.

Exploration in South Australia.—In January last, Mr. W. H. Cornish, of the Survey Department, was engaged for some time in examining the country in the north-east of South Australia proper for a trigonometrical survey, and he has forwarded to the Surveyor-General at Adelaide the traverse made during his journey, together with a report on the country through which he passed. Though parts of the region examined by Mr. Cornish have been visited before, his journal will be found useful in filling in details of its physical features. His great difficulty was the want of good water, and had he not been provided with camels, he would probably have been unable to carry out the objects of his expedition. It is worthy of note that Mr. Cornish reports having met with considerable numbers of natives in the course of his journey, and that, notwithstanding the scarcity of water and food, they appeared to thrive. Some of them were friendly, but others showed a disposition to molest the party. Towards the conclusion of his journey Mr. Cornish crossed a dry swamp which he believed to be Lake Howitt, rather more than a day's journey from his main camp at Lake Killalpininna (S. lat. 28° 30′, E. long. 138° 30′). All the country which he crossed west, north-west, and north of Cowarie, is almost destitute of water, and he reports that there is very little chance of getting it by well-sinking. He got pure salt in the bed of Kallakoopa Creek, which was from 18 inches to two feet thick. The country from Oorawillanie to Salt Creek has a very fresh appearance, and Mr. Cornish is of opinion that good water can be obtained there by sinking. On the edge of the redstone plain in that region, a good well of fresh water has been obtained by striking a spring under crystallised gypsum, at a depth of about 50 feet. This well, he says, will be found very useful to persons travelling to Cowarie, as there is no surface water along the track between there and Cooper's Creek, a distance of nearly 80 miles.

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* 'Proceedings,' vol. i., 1879, p. 777.

Dr. Finsch's Expedition to the North Pacific.—The well-known German naturalist, Dr. Otto Finsch, of Bremen, having published the narrative of his recent Siberian expedition,* has now started on another journey to the less-known islands of the Northern Pacific, in aid of which he has received a grant from the Humboldt fund, administered by the Academy of Berlin. Dr. Finsch reached Honolulu viâ Washington and San Francisco in July last, and, writing thence, gives a curious account of the way in which the native plants and birds of the Sandwich Islands have been supplanted by introduced species. In passing through the streets of Honolulu, the "eyes of the stranger," Dr. Finsch says, "are caught by the immense numbers of mainas (*Acridotheres tristis*, I believe), a kind of starling which has been imported from China. These mainas are a great nuisance to the inhabitants, as they drive away the pigeons and fowls, and are said to destroy the nests and eggs of the domestic birds. Their nests, which are constructed of fine roots and twigs, form great disorderly heaps, and contain at this season two young ones (very young and still naked), or two eggs. The mainas are ever active and vociferous, and the noise made by hundreds crying at their roosting-places is indescribable. In a large private garden, where the finest trees, chiefly palms, abound, hundreds and thousands come to roost, and their inharmonious concert, commencing at six in the evening, lasts for an hour or more. The same is the case at daybreak a little after five o'clock. Next to the mainas our European house-sparrow (*Passer domesticus*) takes the chief place, and it is very interesting to the stranger from the west to see his fellow-countryman, the common house-sparrow, located in coconut-trees in company with mainas, just as if it had always been accustomed to this tropical perching-place.—Besides the noise of the mainas, and the chirping of the sparrows, the call of a turtle-dove is to be heard in every garden. This is also an introduced species from China (*Turtur chinensis*). These three species were all I saw during a week's stay at Honolulu."—In order to obtain examples of the native birds of the Sandwich Islands, Dr. Finsch was compelled to make excursions far into the interior. Even here, in the high Haleakala ranges, he found indigenous birds very scarce, and complains that the native forests and their feathered inhabitants are going the same way to destruction.—On the 28th of July last Dr. Finsch left Honolulu in the bark *Hawaii* for "Jaluit," or Bonham Island—one of the southernmost of the Marshall group—where he arrived on the 21st of August, after nearly suffering shipwreck in traversing the passage into the inner lagoon. Dr. Finsch gives but a poor account of the fauna of Bonham Island, except as regards the fishes, which are numerous and of most beautiful colours. He was much occupied by ethnographic work, this island being visited by natives from Radak, Ralik, Gilbert Island, Rotumah, and other little-known islands of the adjoining groups.

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* Reise nach West-Sibirien im Jahre 1876. Berlin, 1879 (*vide* 'Proceedings,' vol. i. p. 686).

Professor Nordenskiöld has been presented with a medal by the recently established Tokio Geographical Society, in commemoration of his successful accomplishment of the North-East passage. This medal, according to the Japan papers, bears on one side the words:—"Tokio, Japan—Society for Geographical Science—16th September, 1879." On the other side is the following inscription:—"The *Vega* arrived at Yokohama on the 2nd of September from a voyage through the ice sea, a feat now performed for the first time, and of the greatest importance for geographical science. We congratulate ourselves upon having the honour to receive the members of the expedition at dinner * to-day, and, as a souvenir, we present this medal to the chief of the expedition, Professor Nordenskiöld." During a subsequent visit to Hiogo, Professor Nordenskiöld, accompanied by a Japanese official, made an excursion to Kioto, in order that he might visit Lake Biwa, with the object of taking soundings in it, and for purposes of scientific research in the neighbourhood.

Establishment of a Refuge and Observing Station in Novaya Zemlya.—In 1877 the Russian Government determined to found a station in Novaya Zemlya for the relief of shipwrecked sailors, and to take there a series of meteorological observations for twelve consecutive months. Lieutenant Tiaguine was appointed to this duty, and on August 15th, 1878, he arrived at Karmakul harbour (72° 30′ N. lat.) in Möller Bay, which he selected in the previous year for the Samoyede colony under his charge. In about a month's time the necessary wooden huts were built, and the arrangements made for taking observations. The autumn proved rainy and cold, the mean temperature being about 39°·20 F. The first frost occurred on September 26th, the first snow fell on September 28th, and the sea froze on October 10th. Drift ice began to be visible in the middle of the same month, and on November 13th the harbour and small neighbouring bays were frozen over. Möller Bay, however, did not freeze over during the whole of the winter, except among the islands. The first thaw happened in the middle of May, and by June 14th the small islands were covered with verdure, but the harbour was not clear of ice till July 16th. The mean temperatures were as follows:—November, 49°·64 F.; February, 0°·04 F.; March, 10°·76 F. During the five winter months the mean temperature was 10°·04 F. The wind varied considerably, sometimes rising to violent storms from E.S.E. The snowfall is stated to have been inconsiderable, though the snow was blown from distant parts into deep drifts against the exposed side of the huts. Lieutenant Tiaguine returned to Archangel on August 17th, and, as the result of his experience, considers wintering in Novaya Zemlya quite practicable, especially for Samoyedes.

The Boundary between British Guiana and Venezuela.—Mr. Everard F. im Thurn, of the British Guiana Museum, Georgetown, Demerara, has recently discussed the vexed question of this boundary, practically in reply to some articles on the subject published at Caraccas by Señor F. J. Marmol, apparently with official sanction, and which have been brought before the British public by a translation appended to Mr. Boddam-Whetham's 'Roraima and British Guiana.' The territory claimed both by British and Venezuelans commences on the western bank of the Essequibo, and extends for an undefined distance towards the Orinoco. Along and near the banks of the former, at least during the lower part of its course, is a fairly dense population of English subjects, with a corresponding riparian distribution of Venezuelans on the latter river. The intermediate space is inhabited only by some scattered Indians, and visited at long intervals by a few travellers and traders. It is chiefly low-lying swamp, covered with dense forest; and the Pomeroon, Morooca, Waini or Guainia, and Barima rivers, with their tributaries, which run through it to the sea, are not of any importance.—Among the complaints of British aggression, Marmol includes expeditions in 1857-67 to the gold-mines of Tupuquen on the Yuruari, a tributary of the Cuyuni; but Mr. im Thurn points out that our workings were near the Cuyuni itself, twenty or thirty days' journey from Tupuquen, which he admits is certainly very far within the Venezuelan boundary. He also shows the inaccuracy of other charges. Negotiations have in fact been from time to time attempted since 1841; and the difficulty appears to consist in the want of a well-defined natural frontier line, there being no great and long river, and no continuous range of mountains at any point between the Orinoco and Essequibo. Marmol's claim is the western bank of the latter river from its mouth to the junction of the Rupununi; and he considers this a generous one, since Venezuela, as the successor of Spain, really has, according to him, dominion up to the limits of French Guiana—an area based upon Governor Don José Dibuja's map of 1761, which, as Mr. im Thurn shows, also includes French Guiana, in fact everything up to Brazil. Other boundaries suggested at various times are: (1) that based on Sir Robert Schomburgk's survey of 1835–40 (not published until 1877, though utilised in Barrington Brown's map of 1873), starting north from a somewhat mythical Dutch post at the mouth of the Amacura (a river which runs into the mouth of the Orinoco a little to the west of the Barima), following that river, and utilising other unsatisfactory natural features. This scheme, based on our title as the successors of the Dutch, is admitted to be untenable. (2) The line on Codazzi's semi-official map of 1840, which starts from a Dutch post on the Morooca, follows that river to its source in the Sierra de Imataca, then runs south along the crest of that range to the point nearest the old Dutch outpost on the Cuyuni, to which post it goes in a straight line. So far this is acceptable by us, both historically and physically. But Codazzi then carries his boundary along the south bank of the Cuyuni and also of the Mazaruni, to the point where Bartica Grove now stands, and then follows the Essequibo to the junction of the Rupununi. This would deprive us of many thousand square miles, with a considerable number of British, but not any Venezuelan, settlers. (3) A line (delineated in 1844, but never proposed to Great Britain), commencing as in Codazzi's map, with a meridian from the source of the Morooca, crossing the Cuyuni to the Pacaraima Range, which divides the Essequibo and Rio Branco. (4) A line, proposed in 1845 by Great Britain, from the mouth of the Morooca to the point at which the Barama unites with the Guainia; thence up the Barama to the Aunama, ascending the latter to its nearest approach to the Acarabisi, which is followed to its confluence with the Cuyuni; then continuing up the latter till it arrives at the high lands in contact with the Roraima Range, dividing the Essequibo and Rio Branco. Mr. Boddam-Whetham has pointed out a serious error in this boundary, as no possible line following the Cuyuni could reach anywhere near the Roraima Range.—The discovery of gold at Tupuquen in 1857, and on the British side of the Cuyuni in 1863, for a time caused fresh attempts at a settlement to be made, but with no result; and the present revival of the question is not improbably owing to the success of the Caratal gold-mines, which under some of the proposed adjustments would belong to British Guiana. At all events, the cession of the portion now claimed by Venezuela, added to minor Brazilian claims on the south-west, would reduce our colony from some 76,000 square miles to less than 14,000 square miles, and would deprive it of a highly cultivated and more or less thickly peopled tract, including the flourishing convict settlement on the Mazaruni. There would appear comparatively little difficulty in adjustment on the Brazilian frontier; and Mr. im Thurn suggests the following as the most convenient boundaries for the whole colony. From the mouth of the Morooca to the Cuyuni, the line on Codazzi's map should be followed; it should then be carried straight to the nearest point of the Mazaruni, up that river to the junction of the Cako, and up the Cako to Roraima. From that point the line laid down on Schomburgk's map should be followed south to the source of the Corentyne, and that river followed northward to the Atlantic.

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* See vol. i. p. 792.

The North-East Passage.—Professor Nordenskiöld's Account of the 'Vega' in her Winter Quarters.

(*Concluded from* p. 802, vol. i., 1879.)

On the morning of the 6th October, Vasili Menka, the chief of the Reindeer Tchuktches, paid a visit on board the *Vega*. He was a short, dark man, dressed in a handsome white reindeer-coat which he wore over a blue flannel shirt. To convey an idea of his importance and perhaps also not to risk his precious life, his sledge was drawn over the ice not by dogs but by his own servants. For the same purpose he brought with him some of his treasures, consisting of a few red fox skins and some white skins. He could neither read nor write, and his Russian was very faulty and hard to understand; but he was soon able to point out on a chart many places of note in North-eastern Siberia. Although the highest official in this part of the country, he had no knowledge whatever of the existence of a Russian Emperor; he had heard, however, of a great personage who resided at Irkutsk. At first he crossed himself with great fervour at the sight of some photographs and engravings in the gun-room, but soon ceased when he noticed that the ship's company did not do the same. Menka was accompanied by two natives with very oblique eyes and dressed alike, who seemed to be his servants or bondsmen. On their arrival these men carried with a certain solemnity Menka's presents of welcome; he received in return a flannel shirt and a few bundles of tobacco. Menka mentioned that on the following day he was going to Markova, a small settlement inhabited by Russians on the River Anadyr, near the ancient Anadyrsk. Professor Nordenskiöld had not yet given up the hope of getting away before the autumn; still he determined not to let this opportunity pass for sending home news of the *Vega's* situation and of the state of affairs on board. An open letter was written in Russian and addressed to His Excellency the Governor-General of Irkutsk, with the request that he should communicate the contents to H.M. King Oscar. A few sealed letters were also enclosed between pieces of board and given to Menka to be delivered to the Russian authorities at Markova. These messages appear to have reached their destination, though at first it seemed as if Menka considered the documents as intended to invest him with greater authority. As soon as he went on shore he called together a number of Tchuktches, sat down in their midst with an air of great importance, unfolded the paper and holding it upside down, he read out long sentences in the Tchuktch language to an audience devoutly impressed with Menka's learning. On the following morning the great and learned chief paid another visit, when new presents were exchanged. Every effort was made by those on board to entertain him and at last he began to dance to the sound of the organ, first by himself, then with some of his followers, to the great amusement of the Europeans and Asiatics present.

The state of the ice remaining unchanged, advantage was taken of the delay to explore the interior. Lieutenant Nordqvist and Lieutenant Hovgaard received permission to pay a return visit to Menka's settlement. Lieutenant Nordqvist gives the following account of their journey:—"Tuesday, the 8th October, at half-past ten A.M., Lieutenant Hovgaard, Menka, and myself set out from Pitlekaj on sledges drawn by dogs in a S.S.E. direction. Hovgaard and I, each had a driver. Menka was accompanied by a servant who ran in front nearly the whole time, showing the way. Harnessed to my friend's sledge which was the heaviest, were ten dogs; to mine eight, and to Menka's, in which he sat alone, five. Usually the Tchuktches allow four or five dogs to a sledge carrying one person. The first part of our journey was over a boggy and watery plain, but further inland the ground became more hilly and when we arrived at eight o'clock the following morning at our destination, we found ourselves surrounded by mountains, some of which rose about 1000 feet above the bottom of the valley. Through the thin layer of snow we could still distinguish the nature of the vegetation. The commonest plants in the drier spots were *Aira alpina* and *Poa alpina;* in the low-lying places grew *Glyceria*, *Pedicularis*, and *Ledum palustre.* Everywhere could be seen *Petasites frigida* and a species of willow. The latter plant grew principally on the slopes in large clusters forming patches several hundred feet square, and in some places this shrub rose three or four feet above the ground. The prevailing rock seemed to be granite. The bottom of the valley was of post-tertiary formation and consisted of sand and pebbles.

"On our arrival we were met by the principal men of the settlement. They saluted Menka in the Russian fashion, that is to say, they kissed each other first on each cheek and then on the mouth. They received us in the usual way by holding out the hand and bowing. Then we went into Menka's brother's tent, outside which soon the whole population collected. The settlement consisted of eighteen tents placed on each side of a river which flowed through the valley. They were inhabited by Reindeer Tchuktches who traded with the Russians at Kolyma and with the people who lived on the other side of Behring Strait and called by them Jekargauler. Between the tents there were a lot of laden and empty sledges. The knives, axes, borers, &c., which I saw, were made of iron and steel, and had evidently been obtained from the Americans or Russians. The household utensils included some ordinary coffee-pots of copper used to boil water in, a goblet with English inscriptions, a few tea-cups and dishes, flat wooden bowls and measures. The Reindeer Tchuktches dress like the Coast Tchuktches, with the exception that the former wear nothing but reindeer-skins, while the latter also make use of seal-skins. Some of them on our arrival dressed themselves in many-coloured frocks, probably of Russian manufacture. Amongst the ornaments were glass beads strung together and worn by the women in their ears and round their necks. The women were tattooed like those of the Coast Tchuktches, though I saw here an elderly woman who was not tattooed as usual in the face, but on the shoulders, and another who had on the back of her hands two parallel lines running lengthwise and one across. The men were not tattooed. A few of them wore crosses round their necks with Slavonic inscriptions, others two-branched pieces of wood. Whether these last were regarded by them as idols or charms, I was not able to ascertain.

"As we could not obtain here the reindeer which we had come to purchase for the Expedition, we started in the afternoon of the same day with Menka to his son-in-law's place, where we arrived at eight o'clock in the evening. We had a very friendly reception and stayed here for the night. All the inmates of a tent sleep together in the same sleeping-place, which is about seven to eight feet long, six to seven feet broad, and from four to five feet high. Before going to bed they had their supper. Men and women sleep entirely undressed, except a '*cingulum pudicitiæ*' about six inches broad. In the morning the servants get up first and cook some meat, which, cut in slices, is handed round on a tray in the sleeping compartment before its inmates have dressed. Here we saw how the Tchuktches catch and kill the reindeer. Two men go out among the herd, and having selected an animal, one of them throws from a distance of from 20 to 30 feet a noose round the creature's horn. The reindeer now struggles to escape, often dragging the man about with him, while the other tries to get near the animal, catches it by the horns and throws it on the ground, when it is killed by a stab behind the shoulder. Then the reindeer is handed over to the women who make a cut in its side and take out the entrails. The stomach, after being emptied, is used to contain the blood. Finally the animal is skinned.

"At about ten o'clock in the morning we began our return journey. At nightfall our guides sought shelter in a miserable Tchuktch tent on the shore of Utchunutch Lake. It was partly sunk into one of the small hillocks which here are found along the shores, and are probably the remains of some ancient Onkilon dwellings.* The present inmates of the tent, two elderly men and an old woman, had arranged their dwelling in the following manner. In the centre of a cylindrical hole about three feet deep and from 12 to 15 feet wide, rose a vertical pole, from the top of which a number of slanting poles covered over with hides reached down to the ground all round the hole. The sleeping compartment peculiar to a Tchuktch's tent was not absent here, but otherwise the dwelling showed signs of poverty and discomfort. The principal food of the inmates seemed to be fish, as we concluded from the nets hung up outside and from the fish which they placed before us. Some articles of dress, an iron pot, a few wooden bowls and a schaman-drum were the only articles I could discover in the tent. The following day we continued our journey. On the other side of Utchunutch Lake we saw two dwellings, both of which consisted only of a boat turned upside down, with some skins drawn over it. The remainder of our way took us past the hamlet of Najtchkaj and through Irgunnuk, where we were most hospitably received. At a quarter past seven in the evening of the 11th October we were again on board the *Vega*."

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* Onkilon is the name given by Wrangel to a tribe formerly inhabiting these coasts.

Lieutenant Hovgaard's Report, which chiefly treats on the topographical features of the district traversed, contains the following remarks on the powers of endurance displayed by the Tchuktches and their dogs. During the journey out which lasted 21½ hours, Menka's servant ran continually in front of the sledge, and even when we rested he was at work seeking out the track, tending the dogs, &c. When we arrived at the camp he took no sleep and yet he was equally fresh the following day. During the journey he did not partake of any spirituous liquors by the express command of Menka, who explained that otherwise he would not be able to hold out in running. Instead, he chewed a surprising amount of tobacco. All this time the dogs were not unharnessed for a moment and in the morning they lay sleeping in front of the sledge, half covered with snow. We never saw a Tchuktch give them any food, and all they got was the frozen excrement of foxes and other animals which they snapped up while running. Yet we could not, even during the last days of our excursion, observe any diminution in their strength.

On the morning of the 5th December Lieutenant Nordqvist set out in a dog-sledge for the hamlet of Pidlin, situated on Koljutchin Bay. He went there to ascertain how soon a Tchuktch, named Tcheptcho, with whom he had arranged to go to Anadyrsk, would be ready to start. His driver was a Tchuktch, called Anango, and belonging to Irgunnuk, situated to the eastward of Pitlekaj. The sledge, which was small and light and furnished with runners made of whalebone, was drawn by six dogs, the leader of which was harnessed in front of the other five. They were each fastened with a thong, which was again tied to a board in front of the sledge. The dogs were weak and badly cared for and their pace was not more than from two to three English miles an hour. The journeys there and back occupied severally from eight to nine hours, consequently the distance between Pitlekaj and Pidlin would be about 25 miles.

About two hours' journey west of Jintlen the coast rises to a height of from 30 to 40 feet above the sea-level, and is called Petchanin. Here they met a Tchuktch who was travelling eastward with a large sledge full of reindeer skins, which he was going to barter. About half-way between Jintlen and Pidlin is situated Majngatir. The coast between Jintlen and the last-named district forms a narrow sandy strip, above which rises a steep slope from 20 to 40 feet high—the sea-bound northern limit of the *tundra* or barren moss-covered plain which stretches inland. At short intervals this steep slope is intersected by small valleys. To the westward of Majngatir as far as Cape Tcheautau, a distance of about four English miles, the coast retains the same character, but is considerably lower. From Cape Tcheautau the way stretched over a level plain at some distance from the coast, and for about an hour and a half skirted a large bog. These bogs are, as the native driver remarked, only a few feet deep. This district is called Kynmanka. To the southward a chain of mountains extended, as far as one could judge, in a direction from north-east to south-west.

The settlement of Pidlin consists of four tents and is situated on the eastern shore of Koljutchin Bay. It numbers something over twenty inhabitants. Pidlin and Koljutchin Island are the only inhabited places on Koljutchin Bay. Lieutenant Nordqvist was received by the inhabitants outside the village and conducted to the tent belonging to Tcheptcho who promised to go with him in February to Anadyrsk. He had a wife and three children. For the night the latter were entirely undressed, but the grown-up people wore short trousers, those of the host made of tanned skin, those of the wife of cloth. On account of the oppressive heat maintained during the night by two burning lamps, it was difficult to sleep in the heavy reindeer clothing, and a fearful smell which pervaded the tent rendered it necessary to go from time to time outside to breathe the fresh air. Among the objects of ethnographic interest there were—besides the never absent schaman-drum, but which here did not seem to be looked upon with the superstitious awe remarked elsewhere—bundles of amulets fastened with a strap, and a wolf's skull. The former consisted of wooden sticks a few inches long, such as are often worn by the Tchuktches on the breast together with pieces of the cartilage of a wolf's nose and a flat stone, placed next to the skin, as an effective protection against sickness. The wolf's skull, which Lieutenant Nordqvist had taken hold of, had to be returned, in order that the host's little son might use it, as he was told, with his mother's permission, for what purpose it was not possible to ascertain. While the driver was harnessing the dogs for the return journey, some little girls were seen dancing in the same manner as the girls of Pitlekaj and Jintlen. Two girls usually place themselves either opposite to each other or side by side. In the former case they often put their hands on each other's shoulders, swaying in turn first to one side and then to the other, and occasionally jumping with closed feet and turning round, while marking the time by singing or rather grunting. The journey home was commenced at 8 A.M., during which the driver sang Tchuktch songs. These are often only imitations of the cries of animals, or improvised tunes without any definite measure or rhythm and with hardly any change of note; only now and then a distinct melody can be heard. In the evening the driver pointed out several stars by their Tchuktch names.

The 17th February, 1879, Lieutenant Brusewitz, accompanied by the Tchuktch Notti, made an excursion to Nasskaj. Having left the *Vega* in the afternoon, he arrived after a few hours' walk at Ratinup, the home of Notti, where he spent the night. They were welcomed by Notti's three younger brothers and a sick sister who were all living in the same tent. Immediately on their arrival one of the brothers went to order dogs and a sledge for the following day's journey; the rest went into the tent where the sick sister lay wrapped up in reindeer skins. She was tending two lamps, fed with blubber, and over which were suspended two cooking-vessels. On entering, Notti immediately took off his boots and his cap. One of the brothers came in with a tray laden with seal-blubber and cold vegetables, chiefly willow-leaves. The blubber was cut into cubes about an inch thick and one of the brothers gave the sister a good portion of blubber and greens, before the food was distributed among the rest. Every piece of blubber was carefully rolled into the greens before being eaten. When the vegetables were finished, the blubber left was given to the dogs which lay in the outer tent. Next came boiled rib of seal and lastly a kind of soup, probably made with seal's blood. The sister always received first and separately her share. Lieutenant Brusewitz was invited to eat of every dish, but although he declined, it did not seem to give any offence. When the meal was over, the dishes were put aside, the fur coats thrown off, and several reindeer skins taken down from the roof and spread out. The elder brothers lighted their pipes and the younger one lay down to sleep. What was apparently Notti's own sleeping-place was assigned to the lieutenant. A lamp was put out, and one after the other went to sleep. During the night the girl complained several times, when one of the brothers got up and waited upon her.

At 6 A.M. the company woke up and prepared for departure; but the dressing occupied some time, as much care had to be taken about the covering of the feet. On this occasion no food was produced and the natives contentedly shared the visitor's store of bread and Wickström's beefsteaks. Immediately after breakfast four dogs were harnessed to the sledge and Lieutenant Brusewitz and Notti continued their journey to Nasskaj, the former riding, the latter running by the side of the sledge. A short halt was made at Irgunnuk, situated one English mile eastward of Ratinup, in order to borrow more dogs, but there were none to be had. Proceeding along the coast they arrived at about ten o'clock in the morning at Nasskaj, placed eight or ten miles E.S.E. of Irgunnuk. Here they were received by some of their old acquaintances of Pitlekaj who had pitched their tents at this fishing station. The encampment numbered thirteen tents, the five westernmost of which, of smaller size than usual, were occupied by the former inhabitants of Pitlekaj; the eight eastern ones by other Tchuktches. All these tents, here as well as at Ratinup and Irgunnuk, contained large stores of seal-blubber, and pieces of seal and entire seals were stacked outside, covered with snow. On the way to Nasskaj several sledges were met with, laden with seal, going towards Pidlin. At Nasskaj Lieutenant Brusewitz went out hunting in the company of a Tchuktch. They saw eight hares and a red fox, but found no trace of ptarmigan. On the return journey Irgunnuk was reached at nine o'clock in the evening, and a sledge drawn by ten dogs soon brought them back to the *Vega's* winter quarters.

On the 17th March, 1879, Lieutenant Palander, accompanied by Dr. Kjellman, went with a sledge and five men, one of whom was a native guide, to a settlement of Reindeer Tchuktches situated near Table Mountain to the south-west of Pitlekaj, with the object of procuring fresh reindeer meat. The expedition was supplied with two days' provisions, tents, mattresses and furs. The Reindeer Tchuktches were found eleven English miles from the ship. On a hill they saw two tents, one uninhabited, the other occupied by Rotchetlen, his young wife and another young couple, the latter apparently staying on a visit, as their actual home was at Irgunnuk. The tents were much smaller than those usually seen along the coast and outside were piled up a number of sledges, very large and broad, with heavy runners roughly hewn out of wood. The proposal to barter for reindeer was at once rejected, although rum, tobacco, bread, and even a gun, were offered in exchange, the reason given for the refusal being that at this season of the year the reindeer were too lean to be killed. About fifty of these animals were seen grazing on a hill a quarter of a mile distant.

The principal occupation of the women during the day seemed to be to dress each other's hair. The one who on this occasion acted as waiting-maid picked out the parasites from the other's hair and conducting them to her mouth crushed them with her teeth. In the afternoon Dr. Kjellman and Lieutenant Palander were invited to their tent. As they entered, the lamps were lighted and the servant tried in every way to make them comfortable, rolling up reindeer skins to serve as pillows and preparing a place where the travellers could lie fully stretched out and enjoy a much required rest. In the outer tent the other woman cooked the supper, consisting of seal meat, which they were kindly invited to share, but not liking seal they excused themselves under the plea that they had just dined. The natives took their meal with the body in the inner tent and the head protruding from under the reindeer curtain into the outer tent where the food was. After the meal the heads were withdrawn, the host undressed himself with the exception of his trousers, and the hostess allowed her furs to fall from her shoulders, thus exposing the upper part of her body. The reindeer slippers were taken off, wiped, and hung up from the roof over the lamp to dry during the night. The women were offered some sugar which, on account of their complete ignorance of this substance, they first examined with some care, but afterwards seemed to enjoy very much. After the meal they became sleepy, so the travellers said good night and retired to their own tent which was anything but warm, the temperature during the night remaining at about −11° C.

After an almost sleepless night they rose at half-past six and stepping outside the tent they saw all the reindeer coming towards them in closely packed order. In front walked an old reindeer with very tall horns, which went up to its master who had in the meanwhile come out to meet the herd, and said good morning to him by rubbing its nose against his hands. The other reindeer all this time stood in regular file like the crew on board a man-of-war during "division." The owner then went and greeted each reindeer, and they all rubbed their noses against his hands. He on his part took each of them by the horns and thoroughly examined it. The inspection over and at a given signal from the owner, the whole herd faced about and returned in close order, with the old one in front, to the previous day's grazing-place. The whole scene made a very favourable impression. Here it was not the cruel, harsh savage who showed his superiority over the animal in a barbarous manner, but the good master who kindly considers his dependants, and has a friendly word for each of them. This treatment establishes a very good understanding between man and beast. The owner himself was a stately young man with an intelligent countenance and a supple, handsome figure. His dress was of first-rate cut and made of unusually fine reindeer skin, which closely fitted his nimble waist and displayed to advantage his graceful and noble bearing. Repeated offers to barter for reindeer having met with persistent refusal, the tents were struck and the return journey commenced. After a drive of four hours and three-quarters the party arrived on board at 3 P.M. on the 18th of March. The road to the settlement passed over slightly undulating ground. The snow was hard and smooth, favourable to rapid progress. On the journey out, four foxes and some ravens were seen, and in one place a number of lemming holes, dug down through the snow in a slanting direction, but most of them scratched up by foxes. The entrance of an untouched nest of lemming is cylindrical and about an inch and a half in diameter. The weather during both days was snowy and misty, so that the travellers could only see a short distance before them; yet they never lost their way, thanks to the good eyes and the strong instinct of locality possessed by the native guide.

For the use of future Arctic expeditions Professor Nordenskiöld gives the following description of those parts of their winter equipment which were found to be most serviceable. According to the meteorological observations the winter was not particularly cold when compared with the winters experienced in the Franklin Archipelago and in the coldest regions of Siberia. On the other hand the *Vega's* winter station proved unusually stormy, and day after day and night after night the officers had to walk in a heavy gale of wind to the observatory, nearly a mile distant from the ship, and with the thermometer ranging from −30° C. to −46° C. In calm weather a temperature of from −40° to −50° was not felt so severely, but even with a slight breeze a temperature of −35° and over, became quite dangerous to those who tried to walk against it, or incautiously exposed parts of their face, hands or wrists. Without giving warning by any violent pain, frostbites occurred, which, if not thawed in time by rubbing the injured part with the hands or with melted snow, soon became serious. Most of those who were wintering in the Arctic regions for the first time were more or less frostbitten as soon as the cold set in, and in several cases large blisters, an inch in diameter, made their appearance, but happily no serious calamity occurred. Nor was there a single accident of frostbitten feet, owing to the excellent foot-covering used by the expedition and which consisted of large canvas slippers with soles of leather lined with a layer of "Sennegräs" (*Carex vesicaria*). Each foot was encased in one or two pair of stockings and a covering of felt. This arrangement was a compromise between the foot-covering introduced by Parry for Arctic travelling and the boots filled with hay used by the Laplanders. All who used it were of opinion that it left nothing to be desired. On long journeys in the wet snow this foot-covering is preferable to leather, which becomes heavy and soaked and hardly dries in the open air during the night, while canvas shoes filled with hay dry readily. Even when wet, they are light and healthy on account of the air which circulates through the hay. Professor Nordenskiöld therefore strongly recommends this mode of shoeing for travelling and hunting in winter in his own country.

For protecting the hands, gloves were used made of sealskin and chamois, lined inside with sheepskin, and with a border of long-haired fur round the wrist. They were generally suspended by a string round the neck, as children are made to carry their gloves. Besides these, for out-of-door work, thin woollen gloves were always worn. The rest of the costume consisted of the ordinary Swedish winter clothing, perhaps a little heavier and warmer than usual. Reindeer coats and reindeer leggings were provided for every man, besides a variety of furs, but they were seldom used, even when the thermometer stood at −45° C., the men preferring a loose canvas suit worn over the ordinary sailor's dress and which afforded a welcome protection against snow and wind. The head was similarly sheltered by a hood worn over the Helsingör cap, a supply of which had been procured from St. Petersburg.

Observations on the weather were taken until the 1st November every fourth hour, from that date until the 1st April every hour, afterwards again six times a day. Between the 27th November and the 1st April the instruments were placed on the land at the magnetic observatory, before and after that time on board the *Vega* or in the immediate neighbourhood of the ship. During the winter the superintendence was entrusted to Dr. Stuxberg, who, when everything around was covered with ice, had to abandon his own zoological researches.

The meteorological observations made in the *Vega's* winter quarters form the first complete contribution to our knowledge of the climatic conditions which prevail in the peninsula that separates the Frozen Sea of Siberia from the Pacific Ocean, and the information obtained on this occasion regarding the monsoon-like north-west winds which steadily blow in this part of the world during the winter, is of importance not only as regards the climatology of Siberia in general, but also in connection with the study of the typhoons and monsoons encountered on the coasts of China and Japan.

The greatest cold during the several months was observed on the following days:—

October the 24th	−20°·8 Cent.
November the 30th	−27°·2
December the 23rd	−37°·1
January the 25th	−45°·7
February the 2nd	−43°·8
March the 29th	−39°·8

Twice the barometer rose to an unusual height, namely—

On the 22nd December at 6 A.M.	30·78 in.
On the 17th February at 6 A.M.	31·03 in.

The lowest barometer up to the 1st April was observed

On the 31st December at 2 A.M.	28·69 in.

The weather during the winter was in general very stormy, and the direction of the wind nearest to the earth's surface almost constantly between N.W. and N.N.W. Judging from the direction of the clouds, a similar uninterrupted current, but from S.E., prevailed in the upper strata of the atmosphere, and which, when it descended now and then to the surface of the earth, brought with it a warm and comparatively dry air. The cause of this is readily perceived when we consider that Behring Strait, surrounded by tolerably high mountains, forms a gateway between the warm area of the Pacific Ocean and the cold atmospheric region of the Polar Sea, and the winds here must obey the same laws as the draught from an open door between a warm and a cold room; that is to say, the cold air-current must flow in below from the cold into the warm district, while the warm current of air passes above in the opposite direction. The southerly and south-easterly winds owe their warmth and dryness probably also to the mountains which, according to native accounts, exist in the interior of the Tchuktch Peninsula; the latter, namely, impart to the sea-winds which blow over their crests the character of a *föhn* wind. The coldest winds experienced at the winter station of the *Vega* came from south-west to west, i.e. from the great Siberian plain. Upon the presence of two air-currents contending with each other at a certain height above the earth-surface, depends the rapidity with which the sky in the region of Behring Strait becomes suddenly clouded and as suddenly clear. This phenomenon has already been observed by the celebrated navigator of Behring Strait, the American Admiral Rodgers, who very graphically compares it to the drawing up and letting down of a stage curtain.

While the temperature was falling to −40° C., both the mercury and the spirit thermometers were read off, but below −40° C. only the latter. Here it may be observed that mercury when freezing contracts with such force that the column of mercury suddenly sinks completely into the bulb. The reading of −90° C. which, at a time when the contraction of freezing mercury was not known, was obtained in the north of Sweden and gave rise to an active controversy, is an experiment which may be repeated at any time by reducing mercury below its freezing point in a thermometer divided to −90° C. The freezing of mercury takes place from below upwards, that is to say, the frozen metal, being heavier, sinks down through the still liquid portions, which thus remain at the surface. If while the mercury is in a half-frozen state the liquid portion is poured off from the frozen, one obtains groups of needle-shaped crystals composed of minute octahedrons. None of the mercury thermometers used by the expedition suffered any injury from the alternate freezing and thawing of the mercury. The latter when freezing always contracted into the bulb, although −40° C. on the scale was marked a good way up the tube. It is therefore probable that mercury, like water, requires a greater degree of cold in order to freeze, when it is enclosed in a fine tube.

With regard to the possibility of establishing regular navigation in the Polar Sea of Siberia, Professor Nordenskiöld has come to the following conclusions:—

1. The voyage from the Atlantic to the Pacific Ocean, along the north coast of Siberia, can be accomplished in a few weeks by a suitable steamer manned by experienced sailors, but *so far as the conditions of the Siberian Sea are known at present*, this route is not likely to be of any practical importance to commerce.

2. It may now be asserted that there is no difficulty in establishing communication by sea between the Obi-Yenissei and Europe for purposes of trade.

3. In all probability the voyage by sea between the Yenissei and the Lena, and between the Lena and Europe, may be utilised for trading purposes, but the journey there and back, between the Lena and Europe, cannot be made in the same summer.

4. Further explorations are necessary to decide whether a practicable com-

munication by sea between the mouth of the Lena and the Pacific Ocean can be established. The experience gained up to the present shows that at all events machinery, heavy tools and other goods which cannot be easily conveyed by sledge or on wheels across Siberia, may be sent round by this new sea-route from the Pacific Ocean to the estuary of the Lena.

Professor Nordenskiöld remarks: "Many will undoubtedly think that the expectations here raised are too sanguine. The experience so far obtained regarding the portions of the Polar Sea lying between the Yenissei and Behring Strait is as yet too inconsiderable and affords ample space for a diversity of opinions, and it is certain that the question can only be decided by further experiment. To show, however, how unfounded an unqualified denial is, it will be sufficient to recall the fact that the "*Danska Grönländska Handelns*" steamers, on their voyage to the ice-bound west coast of Greenland, are less exposed to shipwreck and loss of cargo than navigators in the China Sea, and that Norwegian fishing-smacks sail year after year along the west and north coasts of Spitzbergen and beyond latitudes reached with difficulty by men such as Phipps and Tschitschagoff, and by vessels fitted out with all the resources of England and Russia."

The Passage to Japan.—On the morning of the 18th July, 1879, after having been imprisoned in the ice for 294 days, the *Vega* weighed anchor or, more correctly, cast off from the large piece of ground ice to which she had been moored during the winter and which had sheltered her from the most violent storms and ice-pressure. Having first steamed a few miles to the north-west in order to clear the ice-fields, she steered her course along the coast towards the most eastern promontory of Asia, the East Cape. Her progress was impeded not so much by the ice as by the misty weather. Now and then the fog lifted and revealed the same castellated cliff formation which had been already observed in several places on the north coast of Eastern Siberia. It might be compared to the ruins of towns which once boasted of innumerable palaces and temples, hundreds of feet in height and of immense extent, and it formed the only romantic feature in the landscape met with during the voyage. As regards beauty of scenery, the north coast of Siberia is much inferior to Spitzbergen with its deep fiords surrounded by steep, black, and boldly shaped mountains and its dazzling white or azure-blue glaciers. Nor has the north coast of Asia been at any time cut up by glaciers into fiords and cliffs like Greenland, Spitzbergen, and Norway. Along the whole of the enormous distance between the White Sea and Behring Strait there is not to be found at present a single glacier reaching down to the sea, and in autumn the north coast of Siberia is almost free from ice and snow. Only in the high mountains on the east side of the Taimyr Peninsula and between Behring Strait and Cape Jakan are there some valleys filled with snow during the late autumn, but it is doubtful whether any of them form the bed of a real glacier, which in any case would be of small extent and terminate at a considerable height above the level of the sea. Nor does one see any snowy summits or mountains covered with snow all the year round, although some of the mountains, for example, those on the western side of Koljutchin Bay, attain a height of 2000 feet and more. If we may apply the conception of a snow-line, derived from the study of mountains in more southerly regions, to countries situated in the far north, an assumption which cannot be quite taken for granted, then the snow-line of the north coast of Asia must lie at a height of over 1500 feet.

On the 20th July, at 11 A.M., the entrance of the *Vega* into Behring Strait was celebrated by the hoisting of flags and a Swedish salute. Now at last the goal was reached for which so many nations had striven ever since Sir Hugh Willoughby, on the 20th May, 1553, sailed from Greenwich in command of three vessels, the *Esperanza*, *Edvard Bonadventure* and *Bona Confidentia*, upon a voyage of discovery in the North Sea. Many other expeditions from different countries have started on the same errand, always without success, and often with loss of ships and the lives of many brave sailors. After a lapse of 326 years and after the most experienced seafaring men had declared the undertaking to be an impossibility, the North-East Passage has at last been accomplished without the loss of a single life, without a case of sickness amongst those who shared in the enterprise, and without the slightest damage to the vessel. It was also effected under circumstances which prove that the feat can be repeated in most years, perhaps every year; and within the space of a few weeks. Professor Nordenskiöld here adds: "We may be pardoned if under these circumstances we saw with a certain amount of pride our blue and yellow flag go up to the masthead, and heard the Swedish salute in that Strait where the old and the new world seem to shake hands."

From the East Cape the course of the *Vega* was shaped towards St. Lawrence Bay, a large fiord which at a distance of about 40 miles to the southward of the Cape penetrates the Tchuktch Peninsula. Some days after the ship anchored in Konyam Bay, in lat. 64° 49′ N., long. 172° 58′ W. Here also only real Tchuktches, that is to say, reindeer-owning Tchuktches, were met with. Supposing Eskimos to have lived at one time not only at the mouth of the River Anadyr but also at the East Cape, it would seem that their nationality has in later times become completely merged in that of the Tchuktches in the last-mentioned district. Certainly no violent expulsion has occurred within fifty years. Besides, it should be remarked that the name of *Onkilon* given by Wrangel (who visited these coasts in 1821-3) to the old inhabitants driven out by the Tchuktches, strongly resembles the name of *Ankali* which the Reindeer Tchuktches at present apply to the Coast Tchuktches.

It was Professor Nordenskiöld's intention to penetrate as far as possible into St. Lawrence Bay, in order to give the naturalists an opportunity of completing the study of the physical conditions of the Tchuktch Peninsula, which they had carried on during the autumn of 1878 and the spring of 1879, but the entrance to the Bay was found so full of ice that the *Vega* was obliged to anchor off the settlement of Nunamo, situated immediately north of the mouth of the fiord. Extensive, although quite thin and rotten, ice-fields drifted past the ship in such quantities that it was not deemed advisable to remain in this place longer than necessary, and the *Vega* only stopped here until the afternoon of the 21st July.

The encampment of Nunamo is not situated, like other Tchuktch settlements, low down on the beach, but rather high up on a promontory between the sea and a river which here empties itself and seems to be full in the season when the snows melt. Immediately above the strand-terrace rises a high mountain, the slopes of which are occupied by immense boulders, the abode of numerous marmots and of *Lagomys alpinus*, a species of gnawing animal the size of a large rat and remarkable for the care with which during summer it gathers provisions for the winter. The mountain is separated from the sea by a narrow terrace, from 50 to 100 feet high, on which stood about ten tents, and which, as it happened, was adorned with an extraordinary display of flowers. In a very short time and within the space of a few acres Dr. Kjellman here collected a hundred different species of flowers, many of which he had not previously found on the Tchuktch Peninsula.

On the sides of the mountains there were still some patches of snow-drift, and from the summits one could see large masses of ice continually drifting backwards and forwards on the Asiatic side of Behring Strait. Dr. Stuxberg made the ascent of one of the neighbouring mountains. On the way he came across the dead body of a native laid out upon a stone grave of the usual Tchuktch form. By the side of the dead lay a broken gun, a spear, arrows, a tinder-box, pipe, snow-screen, *issil* (a tool used for removing the ice rubbish when cutting an ice-hole), and sundry other things considered necessary for the departed in a better world. The body had been lying in this place at least since last summer, because the pipe was one of the innumerable Dutch clay pipes distributed on board the *Vega* to the natives, and it must consequently have been left here long after the actual funeral.

From Nunamo the course of the *Vega* was shaped for Port Clarence on the American side of Behring Strait, where the ship anchored in the afternoon of the 22nd July, after a passage across a sea covered with drift ice on the Asiatic side and quite free from ice on the American side. Port Clarence is a very large but otherwise excellent harbour, situated immediately to the south-east of Cape Prince of Wales, the most westerly promontory of America. *It was the first real harbour in which the Vega anchored since she left Actinia Harbour on Taimyr Island on the 18th August*, 1878. During the whole interval the *Vega* had continually to be anchored or moored in open roadsteads, without the slightest shelter from wind and waves. Towards the sea Port Clarence is protected by a long, low sandbank, at the northern extremity of which there is a deep and convenient entrance. A large river empties itself into an inner harbour separated from the outer harbour by a sandspit, but the entrance to this inner basin or lake is too shallow for vessels of great draught. The river itself is deep, and at a distance of about 12 miles from its mouth it widens out into another lake, at the upper end of which rises a mountain cleft asunder, and from 2000 to 3000 feet high.

On the 26th July the *Vega* steamed out of Port Clarence, and, favoured by the most beautiful weather, proceeded to recross Behring Strait, her next destination being Senjavine Strait, situated about 115 nautical miles to the south-west of East Cape. During the passage across, soundings were taken, also samples of water for analysis, as well as the temperature at various depths. The dredge or trawl was lowered frequently, with the most satisfactory results. In the course of the 28th the *Vega* stopped, not, as had been at first intended, in Glasenapp Harbour, which was filled with unbroken ice, but at the entrance of the most northerly fiord, Konyam Bay. The inner part of this bay was also covered with ice, the breaking up of which on the 30th July nearly brought the *Vega's* voyage to an abrupt conclusion, by pressing her against the land. Happily the movement was seen in time, steam got up, and the ship removed to a part of the fiord free from ice. The south-eastern shore of Konyam Bay, near which the *Vega* was anchored for a few days, was a waste bog, the breeding-place of numerous cranes. Further inland, the low-lying hills were composed of granite, and above them rose several mountain summits of trachyte formation, about 2000 feet high. The zoologists and botanists, finding the harvest on the neighbouring strand but scanty, proceeded in the steam pinnace to the north side of the bay, where they discovered grassy slopes decked with tall shrubs and a great variety of flowers; and Dr. Kjellman increased his collection of the larger plants of Northern Asia by more than 70 species. Here also the first land mollusca on the Tchuktch Peninsula were met with. Three Reindeer Tchuktch families had set up their summer tents at the outlet of a deep brook on the north-western shore of Konyam Bay. Their manner of life differed but little from that of the Coast Tchuktches near the *Vega's* winter station, and their dress was also the same, with the exception of small bells which they wore on their belts. The number of their reindeer amounted to about 400, which is much less than is required for three Lapp families, but the Tchuktches command greater resources in the way of fish and game than the Laplanders. They drink no coffee and themselves gather the vegetable food which they require. They gave their visitors a very friendly reception and offered to sell or rather barter three reindeer, a transaction which was not completed, on account of the *Vega's* sudden departure.

On the 31st July the expedition anchored off the north-eastern shore of St.

Lawrence Island, called by the Tchuktches *Engnä*. At some distance from Senjavine Strait the last drift ice was seen. The island seemed to offer no good harbour, so after devoting a few days to an exploration which yielded an abundance of zoological and botanical specimens, the *Vega* continued her journey on the 2nd of August and on the 14th dropped anchor in an indifferently sheltered harbour on the north-west coast of Behring Island. Here again the naturalists succeeded in gathering a rich harvest of interesting specimens, amongst others a large collection of the bones of the supposed extinct sea-cow (*Rhytina Stelleri*). The *Vega* left Behring Island in the evening of the 19th August. During the early part of her cruise towards Japan, and whilst the ship was sailing with the cold current which flows from the north, the wind was favourable, the weather mild, and the temperature of the sea-surface between 9° and 11° C. But on the 25th August, when in lat. 45° 45′ N. and long. 156° E., the temperature of the water began to rise so rapidly that on the 28th, in lat. 40° N., long. 147° 41′ E., the thermometer recorded a surface temperature of 23°·4 C. This showed that the *Vega* had left the Arctic current which had hitherto aided her progress, and had entered (what has been called) the Gulf Stream of the Pacific Ocean, known as the Kuro-Siwo. The winds now became less favourable, the weather oppressively hot in spite of violent squalls accompanied by thunder and showers of rain, and on the 31st the mainmast of the *Vega* was struck by lightning.

In the evening of the 2nd September, the *Vega* anchored in the picturesque roadstead of Yokohama, and on the 15th of the same month the three learned societies of Japan, viz. the Tokio Geographical Society, the Asiatic Society of Japan, and the German Asiatic Society received Professor Nordenskiöld and his companions at a great banquet given in their honour at Tokio, in the large hall of the Koku Dai Gaku, and presided over by H.I.H. Prince Kita-Shirakawa-No-Miya.

REPORT OF THE EVENING MEETINGS, SESSION 1879–80.

Second Meeting, *24th November*, 1879.—The Right Honourable the Earl of Northbrook, G.C.S.I., President, in the Chair.

Elections.—*Wynne Edwin Baxter, Esq.; John Charles Bell, Esq.; B. P. Bidder, Esq.; Major-General R. Biddulph,* C.B.; *Thomas Bird, Esq.; Sir Henry Gore-Booth, Bart.; John Linden Bradfield, Esq.; Captain Charles Kennedy Brooke,* 15*th Regiment; Captain Edmund C. Browne,* 21*st Royal Scots Fusiliers; James William Bryans, Esq.; Major-General E. G. Bulwer,* C.B.; *Charles Clauson, Esq.; Major-General John William Cox; Langham Dale, Esq.,* M.A., LL.D.; *Rev. Charles Davis; Charles John Follett, Esq.; Captain Lord Gifford,* V.C.; *G. B. Glover, Esq.; William Bernard Guinee, Esq.; Henry Hayes, Esq.; C. E. Hodson, Esq.; Colonel Montgomery Hunter (Beng. Staff Corps); William Pepperrell Hutton, Esq.; Ibrahim Helmy, Pacha; Andrew C. Johnston, Esq.; Charles Cameron Lees, Esq.,* C.M.G.; *C. Lowenstein, Esq.; Colonel Donald Macintyre,* V.C.; *Alfred Marshall, Esq.; Major Robert James Maxwell,* 96*th Regiment; Thomas McClure, Esq.,* M.D.; *Rev. Dr. J. O. Means; Major-Gen. Francis John Moberly; Ole Theodor Olsen, Esq.; W. G. Pedder, Esq.; Edward Augustus Petherick, Esq.; Major Serpa Pinto; Clement M. Royds, Esq.,* J.P.; *Captain Henry Charles Reynolds,* 106*th Regiment; William Henry Rodd, Esq.; John Ross, Esq.; T. H. Sanderson, Esq.; Dudley E. Saurin, Esq.; Captain William Shepherd,* R.E.; *R. L. Stourbridge Smyth, Esq.,* B.A.; *Captain Daniel Woolcott Stephens; Henry Curtis Stockley, Esq.; Martin J. Sutton, jun., Esq.; Francis Swanzy, Esq.; Frank Tayler, Esq.; Colonel George*

Cadogan Thomson; Colonel Forestier W. E. Walker, C.B.; *Gerald Waller, Esq.; Edward Wheeler, Esq.; John Sheldon Wilkinson, Esq.; Lieutenant Lucien N. B. Wyse.*

The paper read was—

"On the Arctic Campaign of 1879 in the Barents Sea." By Captain Albert H. Markham, R.N. Printed, with discussion, *ante*, p. 1.

Third Meeting, 8th December, 1879.—The Right Honourable the Earl of NORTHBROOK, G.C.S.I., President, in the Chair.

ELECTIONS.—*General Sir John Miller Adye*, K.C.B.; *John Thomas Arundel, Esq.; Montague J. M. Flint, Esq.; Edward Wildy Johns, Esq.; Rev. Joseph Jordan*, M.A.; *Charles J. Longman, Esq.; Captain H. S. G. Miles*, 101*st Regiment; Marcus William Mott, Esq.; J. C. Rounding, Esq.; Arthur William Charles Shean, Esq.; Matthew Tait, Esq.; George Todd, Esq.; James Muschamp Vickers, Esq.; Frank Wyllie, Esq.*

The paper read was—

"A Visit to Nejd." By Wilfrid Scawen Blunt. Paper and discussion, with map, will be published in the February number.

PROCEEDINGS OF FOREIGN SOCIETIES.

Geographical Society of Paris.—November 21st, 1879: M. DAUBRÉE in the Chair.—A letter from the Secretary of the International African Association was read, giving details of the journey of Lieutenant Cambier from Tabora to Lake Tanganyika. Leaving Tabora in May, he reached Karuna on the 12th of August, and concluded an agreement with the chief of that place for the cession of a piece of land of several hundred acres as the site of the station of the International Association. The second Belgian Expedition had reached Kanyinye, and was following the route taken by Cameron. The Indian elephants had crossed the Mgunda Mkali, and had been forty-two hours without drinking and thirty-one hours without eating, marching twenty-seven hours and a half with a load each of 1000 lbs. The experiment of elephant carriage was considered likely to prove a complete success.—A letter was read from M. Verminck, a merchant at Marseilles, confirming the telegraphic news from Sierra Leone, that his agents MM. Zweifel and Moustier had reached the source of the Niger. In the discussion which followed, M. Cortambert said the sources of the Niger were discovered by Major Laing in 1822, but to this M. Malte-Brun replied that grave doubts had arisen with regard to Major Laing's sources, it being thought that these were sources of one of the affluents only, the principal head-water lying further to the east in the Kong Mountains. Such being the case, it was desirable to await further details of the recent achievement before pronouncing a decided opinion.—Dr. Hamy gave an account of the scientific explorations in which M. Leon de Cessac had been for two years engaged on the coast of California. This traveller had made an immense collection of Indian implements belonging to the Stone Age, which he had forwarded to the Museum of Paris.—M. l'Abbé Durand proposed the formation of a committee to decide on the orthography of proper names in geography.—It was announced that M. de Lesseps was about to set sail on the 6th December for the Isthmus of Panamá: MM. Türr and Wyse had returned to him their concession regarding the Interoceanic Canal, and he had already paid, in accordance with the clauses of the contract, 750,000 francs to the account of the Colombian Government. M. Couvreux, contractor at the Isthmus of Suez, has defrayed the expenses of an engineer who has spent two months in investigating the country along the

Panamá line of railway, and has returned to France. Five surveyors left on the 6th November for sounding operations on the isthmus, and M. de Lesseps follows them with a party of engineers selected from Holland, France, and the United States of Colombia and of America. The Académie des Sciences of Paris has nominated a committee for the purpose of drawing up a programme of observations useful to science, to be recommended to the engineers of the works. The members of the committee are: MM. Dumas, Faye, de Quatrefages, Daubrée, Duchartre, Edm. Becquerel, Paris, et D'Abbadie.—As President of the French Section of the International African Association, M. de Lesseps announced that a party of surveyors were about to depart for Africa, to study the proposed line of railway which is to connect Algiers with Senegal. The Chambers had voted 100,000 francs to the International African Association, and M. de Brazza would soon leave, on the part of the French Section, for the Gaboon, with the object of leading an expedition thence towards Lake Chad.—M. Desiré Charnay addressed the Society on the subject of his recent journey to Java and Australia, illustrating his remarks by photographs projected and illuminated by the electric light. He described Batavia, the famous Botanic Garden of Buitenzorg, and the gorges of the great Salak; thence passing to the holy town of Soerakarta, the residence of the emperor, and giving an account of his reception at the court, the dances and public ceremonies, and lastly, describing the marvellous ruins of Bocroeboedor, the chef-d'œuvre of Hindu art in Java. In Australia M. Charny had visited the towns of Melbourne, Sydney, Brisbane, and Adelaide; he spoke also of the aborigines, their legends, strange customs, and traditions. In describing the boomerang, the curious missile weapon of the Australians, he compared its form to that of a eucalyptus leaf, which he thought probably had first suggested the idea to the savages, and attributed the return movement of the missile in the air to its helicoidal surface and the rotatory movement given in throwing it. M. Charny illustrated this explanation by throwing strips of cardboard shaped in the same way, an experiment which succeeded perfectly.

December 5th, 1879: M. Daubrée in the Chair.—The President announced the death of M. Charles Hertz, one of the most active and sincerely respected members of the Society. He was member of the Central Committee and first General Secretary of the Society of Commercial Geography of Paris, and had recently been engaged in editing the voluminous Report of the proceedings of the Interoceanic Canal Congress.—It was announced that the French Section of the International African Association has decided to establish two stations, one on the eastern side of Africa and the other on the Ogowé, the latter to be placed under the direction of M. de Brazza.—Lieutenant Wyse announced his approaching departure for the Isthmus of Panamá, and promised to keep the Society informed of the surveys and observations which he intended to make in connection with the Interoceanic Canal.—A letter was read from M. Huber, now travelling in Syria and Arabia. It was dated November 2nd, from 34° 4′ N. lat., 35° 8′ E. long. (Paris), and announced that the traveller was journeying in company of the tribe of Rouallas in a southerly direction to the plateau of El Hamad, whence he would continue his way towards the Juf.—The despatches of MM. Zweifel and Moustier were then read, respecting their discovery of the source of the Niger. M. Verminck, the Marseilles merchant, who had conceived the idea of this expedition, had chosen two of his employés above-named to carry it out. M. Zweifel had been agent at Rotombo, near Sierra Leone, and M. Moustier held a similar position at Boké on the River Nunez. Both were well qualified for such a mission by their knowledge of the country; M. Zweifel being also acquainted with the principal native languages. Instruments, maps, and some necessary books were supplied to them, besides letters of credit on all the correspondents of M. Verminck. On the 30th of May, 1879, M. Verminck addressed to the two travellers his last letter of instructions. Immediately on its receipt, they engaged the necessary guides and interpreters besides some fifty porters, and the expedition started from Port Loko on the 11th of July. On the 25th they reached Big-Boumba, capital of the Limbahs. The travellers wrote from this place, stating that the route followed so far was a little to the south of that of Mr. Winwood Reade, and passed through a country containing very few trees, being chiefly clothed with bushes, the forest having been cut down since Mr. Reade's time. On the 16th of August they arrived at Falaba. Their plans here were facilitated by an unexpected political event, viz. the recent alliance of the king of Falaba with the Korankos of the district in which the sources are situated. The two travellers consequently not only found the usual obstacles cleared away, but obtained much information regarding the situation of the sources themselves from some Koranko chiefs then on a visit to Falaba. According to them, there were three separate streams which lower down flowed into a small lake, from which they emerged as one river, the Joliba. The travellers seem to have met with great difficulties in reaching the places thus indicated; but they wrote a brief letter on the 3rd of October, stating that they had visited the sources, and particularly that of the Tembi, the principal of the small streams which unite lower down. They were prevented from following the river downward, owing to a native war in that direction.—The General Secretary read a letter which had been written in May 1834 to Marshal Soult, then Minister of War, by Count de Navailles, in which the latter strongly urged upon the French Government the conquest of Timbuctu.—A communication was then read on the people of Annam and Cochin-China, by M. Tran Nguou Hauh.

Imperial Geographical Society of St. Petersburg.—October 15th: M. Semenof, Vice-President, in the Chair.—A report on geographical work connected with the Society which had been performed during the vacation, was read by the Secretary. Passing rapidly in review the Nordenskiöld Expedition, the labours of the Meteorological Station at Novaya Zemlya under M. Tiaguine, and the journeys of Prejevalsky, Potanin, Alferaki and Pévtsof, he entered into some details regarding the important Central Asian Railway Expedition, which was organised at Samara early in the summer, and in which the Society was represented by M. Maief. The party first explored the line between Karatougaï and Tashkend and Samarkand. All the members of the Expedition afterwards met together on the 29th of July at Samarkand, and then agreed on the following division of labour in their further operations, which were to commence on the 5th of August:—Count Rostovtsef, MM. Liapunof, Sorokin, Mousketof, Karazin, and two telegraph employés were to proceed in the direction of Karchi in order to see the Emir and inform him of the intentions of the Expedition; the other members, viz. MM. Sokolovsky, Simakof, Maief, Lounkevitch, Kreitschmer, Valitsky, and Pelzmann were to travel in the direction of Kitab, Shaar, Yartubé and Kultaminar, where they were to await the return of the first party.—The Expedition were to traverse Dechan, Yurchi, Saryosio, Regar, Duchambe, and Baldjonak, and thence follow the Pandje River throughout its whole length. At Hazretimam they were to meet Captain Zoubof who had taken the Petro-Alexandrofsk route at Kobadjan by way of the Oxus. By the 25th of July M. Zoubof was within nine miles of Shirabad, having studied the Oxus through its whole course; all that then remained for the Expedition to do was to explore the old beds of the Oxus, now dried up, which are especially apparent from Chardjui.—The Society had received a telegram from the chief of the Expedition, dated August 22nd, announcing that the routes from Djam to Karchi and from Kitab to Shaar had been explored, as also those from the Iron Gates to the ruins of Termes on the banks of the Oxus.—The Secretary next spoke of various ethnological researches that had been made by different travellers, including those of M. Miklukho-

Maclay, in the Eastern Archipelago, whence he had proceeded to Australia and Polynesia.—A paper was then read on the International Conference at Hamburg in October last, on Scientific Research in the Polar Regions, by M. Lenz.

Geographical Society of Leipzig.—29th November, 1879: Professor ZIRKEL, President, in the Chair.—The President announced the publication of the annual volume of the Society, which contains the following contributions by Members:—Dr. O. Kuntze, On the Erroneous Application of the term Species in the science of Botany; Dr. Jung, On the Climate of Australia; Dr. Obst, On the International Congress of Commercial Geography at Paris; Dr. Pechuel-Loesche, On the Kuilu River, surveyed by him during his explorations on the Loango Coast. An excellent Map of the Kuilu, by E. Debes, accompanies the paper.—The following papers were then read:—"On the attempts at Colonisation made at various times in Costa Rica by German Immigrants," by Dr. Polakowsky, of Berlin, and "On the voyage and wreck of the steamer *A. E. Nordenskiöld*, sent by Mr. Sibiriakoff to the aid of the Swedish Arctic Expedition," by Baron von Danckelmann (meteorologist of the *Nordenskiöld*).

NEW BOOKS.

(By E. C. RYE, *Librarian* R.G.S.)

EUROPE.

Sparkes, E. J.—The Riviera: Sketches of the Health Resorts of the North Mediterranean Coast of France and Italy from Hyères to Spezzia, with chapters on the general Meteorology of the District, its Medical Aspect and Value, &c. London (Churchill): 1879, 8vo., pp. 414, price 8*s*. 6*d*.

ASIA.

Ball, V.—Jungle Life in India; or the Journeys and Journals of an Indian Geologist. London (De la Rue): 1880, 8vo., pp. 720, pls., map, price 1*l*. 5*s*.

It is impossible in a notice like the present to do justice to the immense amount of information on geological, geographical, ethnological, zoological, and botanical subjects contained in this large volume, which practically contains the diaries kept by its author during his work on the geological survey of India since 1864, in the least frequented parts of Western Bengal and the Central Provinces, the Andaman and Nicobar Islands, parts of Biluchistan and Afghanistan, &c. It is a thoroughly scientific and earnest work, to the nature of the contents of which the popular title affords no true index. The appendices contain, beside other matter, a paper on the geographical distribution of stone implements in India (with special plates), lists (with observations) of mammals and birds occurring in the area between the Ganges and Godavari, and in the Andaman and Nicobar Islands, and an annotated list of jungle products used as food in Chutia Nagpur. A double Index facilitates reference to the numerous localities and facts described and recorded; and the work is well illustrated by engravings from photographs by Captain J. Waterhouse, Captain Murray, and Mr. Peppé, and by a map (64 miles to the inch) of parts of Western Bengal and the Central Provinces, showing actual and proposed railroads, coalfields, &c.

Clarke, F. C. H.—Statistics and Geography of Russian Turkestan. London (Harrison): 1879, fo., pp. 110.

This publication of the Intelligence Branch, Quartermaster-General's Department, Horse Guards, is a compilation by Major Clarke, almost entirely from Russian sources (the chief of which are indicated). In an Appendix, Colonel Maieff's account of Hissar is translated; this country, though a dependency of Bokhara, is of importance from its intervening between Russian Turkistan and the northern provinces of Afghanistan. An appendix by Captain L. Marshall contains Routes compiled by Colonel Maieff on the occasion of his second journey in Southern Bokhara in 1878, translated from the 'Journal of the Imperial Russian Geographical Society' for 1878 (vol. xiv. pp. 361–386).

India.—Abstract of the Reports of the Surveys, and of other Geographical Operations in India for 1877–78. London (Allen, Stanford, Trübner, Whittingham, Thacker): 1879, large 8vo., pp. 83, price 1*s.* 6*d.*

This official work records the progress in the Marine, Land, Geological, and Archæological Surveys, and the work done in Meteorology, and on the Statistical Survey and Imperial Gazetteer of India. A paper on Trans-frontier Explorations by C. E. D. Black discusses various recent geographical operations and discoveries in Afghanistan (including a list of passes from Multan to Candahar, by Major Raverty), Chitral, Hundes, Kumaun and Garhwal, the Miri and Mishmi Hills, and the Tibetan portion of the Sanpo.

AFRICA.

Brugsch Bey, Henri.—Dictionnaire Géographique de l'Ancienne Égypte: contenant par ordre alphabétique la Nomenclature comparée des Noms propres géographiques qui se rencontrent sur les Monuments et dans les Papyrus, notamment les Noms des Préfectures et de leurs Chefs-lieux, des Temples et Sanctuaires, des Villes, Bourgs et Nécropoles; des Mers, du Nil et de ses embouchures, des Lacs, Marais, Canaux, Bassins et Ports, des Vallées, Grottes, Montagnes, des Îles et Îlots, &c. Leipzig (Hinrichs): 1879, fo., pp. 1420. (*Dulau*: price 21*l.*)

This gigantic autographic publication, of which the first part was noticed in our 'Proceedings' for 1879, p. 405, is now completed. The subject has occupied its author for twenty years, and comprises upwards of 3600 geographical names.

Buchholz, R.—Reinhold Buchholz' Reisen in West-Afrika, nach seinen hinterlassenen Tagebüchern und Briefen. Nebst einem Lebensabriss des Verstorbenen von Carl Heinersdorff. Leipzig (Brockhaus): 1880, 8vo., pp. 263, map, woodcuts. (*Dulau*: price 6*s.*)

The late Dr. Buchholz, Professor of Zoology at the University of Greifswald, visited the Gulf of Guinea for Natural History purposes, in 1872, his area of work extending from Accra to some distance up the Ogowé, and including various minor expeditions in the Cameroons region, and to St. Thomé and I. do Principe. At the end of 1875 he returned to Germany, and commenced to work out his materials, but died in April 1876. The present account of his experiences in equatorial West Africa is put together from his diaries and letters, and contains much information on the distribution, &c., of the special objects of the deceased author's study. The map (scale 1 : 6,000,000) includes the coast from Cape Three Points to the mouth of the Ogowé.

Lux, E.—Von Loanda nach Kimbundu. Ergebnisse der Forschungsreise im äquatorialen West-Afrika (1875–1876). Wien (Hölzel): 1880, 8vo., pp. 219, maps, pls. (*Dulau*: price 7*s.*)

Lieutenant Lux accompanied the third German West-coast Expedition as geographer, having also charge of the astronomical and meteorological observations. He arrived at San Paulo de Loanda early in May 1875, went by ship up the Quanza to Dondo (usually confounded with the neighbouring Cambambe in maps), and, after staying there some three weeks, started for the interior. His route from Dondo was to the north of the Quanza, through the Pungo n' Dongo range to Malange, where he stayed a month, from which he made two short excursions northwards. Striking east across the Cuiji, he arrived at Sanza, and thence turned across the Talamongonga range in a south-easterly direction, cutting the head waters of the Luhi and various other affluents of the north-flowing Quango, and reaching nearly as far south as Bomba. Then striking north-east across the Mossamba range, he arrived at Kimbundu, after crossing the Cuilo, Peso, and other tributaries of the Luembo. After a stay of some three weeks in

Kimbundu, the author returned to Sanza by another route, crossing the same ranges and rivers as on his journey from that place, but in a more northerly direction, and visiting Cassala and Feira on the way. Some particulars are given of Dr. Pogge's part in this expedition, with various details on ethnological and economical subjects, some of which are figured.

The appendix contains lists of goods and porters for the journey from Malange to Kimbundu and back, with prices at Malange; an itinerary of the northern and southern routes from Kimbundu to the Muata Yanvo's at Mussumbe; astronomically fixed positions for Dondo, Pungo n' Dongo, Malange, Sanza, Porto de Mussessa, Kimbundu, the Quango crossing at Bansa Cassange, M'bungu, and Feira; absolute heights for forty positions (Kimbundu the highest, 2055 metres); meteorological observations in Loanda and Dondo, and during the whole of the journey described; and a dictionary of the Bunda, Mossongo, and Bailundo dialects, with German equivalents (nearly 1000 words).

The maps consist of a plan of Dondo (scale 219 yards to the inch) with elevation contours, &c.; a general map of the country traversed from the coast, with an extension to Mussumbe, showing the northern and southern routes (scale 37·8 geographical miles to the inch); and details and profiles of the routes from Dondo to Sanza, and from Sanza to Kimbundu (scale 3·20 geographical miles to the inch).

Sibree, James.—The Great African Island. Chapters on Madagascar. London (Trübner): 1880, 8vo., pp. 372, pls., maps, price 12*s.*

"A popular account of recent researches in the physical Geography, Geology, and Exploration of the Country, and its Natural History and Botany; and in the origin and divisions, customs and language, superstitions, folk-lore, and religious beliefs and practices of the different Tribes. Together with Illustrations of Scripture and Early Church History from Native Statists and Missionary Experience." This secondary title sufficiently explains the nature of the work, which is practically an amplification of the same author's book 'Madagascar and its People,' published in 1870 by the Religious Tract Society, much added information being from the 'Antananarivo Annual.' The scientific portion has for the most part appeared in our own 'Proceedings' (from which the map is taken; see Oct. No., 1879), and in the publications of the Anthropological Institute, Folk-Lore Society, &c. The work may be accepted as the most concise and reliable description of its subject up to date.

AMERICA.

Amunátegui, Miguel Luis.—La Cuestion de Límites entre Chile i la República Arjentina. Tomo I. Santiago de Chile (Imprenta Nacional): 1879, large 8vo., pp. 464.

The author here gives the first part of a discussion of documents favourable as well to the Argentine Republic as to Chili (commencing with historical events in 1516), bearing upon the question of boundaries between the two powers, and which appears to have been originated by the foundation of the colony Puerto Búlnes in Magalhaens Straits in 1843 by Chili, avowedly in the interests of navigators of all countries, the right to the soil occupied by which colony was first questioned by the Buenos Aires Government at the end of 1847.

North America.—États-Unis et Canada. L'Amérique du Nord Pittoresque: ouvrage rédigé par une Réunion d'Écrivains Américains sous la direction de W. Cullen Bryan, traduit, revu, et augmenté par Bénédict-Henry Révoil. Paris (Quantin): 1880, fo., pp. 779, pls., map. (*Asher:* price 2*l.*)

Vidal Gormaz, F.—Noticias del Desierto i sus Recursos. Santiago (Imprenta Nacional): 1879, 8vo., pp. 21.

This little work, published by the Chilian Hydrographic Office, contains descriptions collected from authorities personally acquainted with the localities of Antofagasta, and the roads from it to the interior, Caracoles, and other points of the Atacama province (including the desert) of special interest at the present time. Particular attention is given to the means of intercommunication.

Vidal Gormaz, F.—Anuario Hidrágrafico de la Marina de Chile. Año v. Santiago (Imprenta Nacional): 1879, large 8vo., pp. 520 & 60, pls., maps.

Apart from the usual hydrographic material (both compiled from the most recent similar publications of foreign Governments, &c., and original, as to Chilian coasts and waters), this work contains accounts of the explorations of Skyring or Despejo and of the southern parts of Patagonia by Captain Latorre at the end of 1877. An appendix by the late Enrique Ibar Sierra, who accompanied the expedition as naturalist, contains accounts of the zoology (particularly referring to the birds) and botany of various points in the Straits of Magallánes, and of the river and lake of Sta. Cruz, the river Gallegos, and other parts of South Patagonia (of which a map is given), with ethnological data and a Patagonian vocabulary. Some climatological and meteorological observations on Valdivia, and historical accounts of the discoveries of the Straits of Magallánes and the discoverers and first explorers of the western coasts of Chile, may also be mentioned as among the non-professional contents of this volume. The account of Valdivia is illustrated by the first sheet of a map (scale 1 : 40,000) of the river of that name, with its affluents.

—— ——, **R.**—Jeografía Náutica de Bolivia. Santiago (Imprenta Nacional): 1879, 8vo., pp. 35, map.

Contains no substantial modification of the first publication in vol. ii. of the 'Anuario Hidrográfico de la Marina de Chile'; the map and added notes, however, bring the subject up to date. The introduction gives a general sketch of Bolivia, and especially of Atacama, the body of the work being confined to the littoral region. The map (scale, 1 : 1,000,000), based upon Villanueva, covers the disputed area, including from 22° to 25° 30′ S. lat., and the whole of the Atacama Salinas, with insets on a larger scale referring to Algodon, Cobija, and Antofagasta.

Vivian, A. Pendarves.—Wanderings in the Western Land. London (Sampson Low & Co.): 1879, 8vo., pp. 426, maps, pls., price 18*s*.

An account of a tour in Newfoundland, Nova Scotia, New Brunswick, Canada, and the Western States to California (chiefly in Colorado), undertaken for sporting purposes, but containing many observations on economical, political, geological, and other points. One of the maps, scale 15 miles to the inch, shows the author's travels in the British North American Colonies; the other, 45 miles to the inch, gives in colours the different formations from Colorado to the Pacific.

AUSTRALASIA.

Haast, Julius Von.—Geology of the provinces of Canterbury and Westland, New Zealand. A Report comprising the results of Official Explorations. Christchurch ('Times' Office): 1879, 8vo., pp. 486, map, sections, pls.

Independently of the purely geological part of this Report, it contains a descriptive account of the author's explorations from the commencement of the survey, containing much information on the physical Geography, Zoology, and Botany of the country, especially descriptive of the Southern Alps. Part ii., pp. 172–235, is specially devoted to Physical Geography, and discusses the orographical features, glaciers, rivers, lakes, and plains in detail. Some of the plates (from photographs) illustrate the salient physical features with remarkable effect and apparent fidelity. The map (scale, 16 miles to the inch) is purely geological.

ARCTIC.

Greenland.—Meddelelser om Grφnland, udgivne af Commissionen for Ledelsen af de geologiske og geographiske Undersφgelser i Grφnland. Fφrste Hefte. Kjφbenhavn (Reitzel): 1879, 8vo., pp. 195, coloured pls., woodcuts, maps.

This first series of Memoirs on Greenland, published by the Commission for conducting geological and geographical researches in that country, contains:—1, Report by the Commissioners Johnstrup, Ravn, and Rink, to the Danish Minister of the Interior on the operations in 1876, 1877, and

1878; 2, Account of Lieutenant J. A. D. Jensen's expeditions in South Greenland in 1878; 3, Geological observations on the West Coast by A. Kornerup; 4, Notes by J. Lange on the plants collected by Kornerup in 1878, and by Kornerup on organic life upon the eastern Nunatak; 5, Astronomical and Meteorological observations by Jensen, and notes on Atmospheric phenomena in West Greenland and over the North Atlantic at the end of July 1878, by N. Hoffmeyer. The Commissioner Johnstrup also gives (in French) an abstract of the results of the recent scientific researches on the west coast and the continental ice of Greenland, with historical remarks upon earlier elucidations of the geography and geology of the country.

As regards the investigations forming the special subject of this Report, those undertaken by Steenstrup in 1876 in the district of Julianshaab, and by him and Jensen in 1877 in that of Frederikshaab, are already tolerably well known, resulting in the preparation of a geological map covering 80 square miles, a map of the ramifications of the fjords and margins of the continental ice, the fixing of a great number of heights, and the discovery and mensuration of various Norsk ruins. Steenstrup's work in the north of Greenland commenced in 1878, and still in progress, has as yet resulted in an exploration of the almost entirely unknown peninsula of Statenhuk (between Umanak and Upernivik), a study of the miocene formations of the Nugsuak peninsula, and observations on the glaciers of Umanak fjord. But the chief interest attaches to the details of the penetration by Jensen and Kornerup in 1878, to the Nunatak elevations of the interior, of which a brief account was given in the report of Dr. Rink's paper read at the last meeting of the British Association, and reported in the last vol. of our 'Proceedings,' p. 736. Illustrations of the chief points of interest, and diagrams of ice and rock formations, accompanied by descriptions of the moraines now known to exist in Greenland, with other glacial phenomena, are given. The maps are of the west coast from Godthaab to Tiningnertok (one showing elevations, sites of ruins, &c., and the other geological formations), and of the course of the inland ice from the Nunataks to the edge of the Frederikshaab glacier, with the fjords to the north.

GENERAL.

Bunbury, E. H.—A History of Ancient Geography among the Greeks and Romans, from the earliest Ages till the fall of the Roman Empire. London (Murray): 1879, 2 vols., 8vo., pp. 666 & 743, 20 maps, price 2*l.* 2*s.*

The aim of this work is to supply an historical review of its subject as a whole, for English readers, who have hitherto been compelled to have recourse to German treatises now considerably behind the times in consequence of increased critical and physical knowledge, or to be satisfied with separate articles on details of particular localities or dates. Physical and mathematical geography are here included with the descriptive and historical aspects, so that the absolute condition of geographical knowledge at every successive period is capable of immediate appreciation. The author considers that his work forms in some degree a supplement to Smith's Dictionaries of Ancient Biography and Geography. The numerous maps are intended to bring before the reader the general outline of the geographical systems formed by successive writers, so far as may be extracted from their writings alone. They represent the Wanderings of Ulysses, the World according to Hecatæus and Herodotus, Scythia according to the latter historian, Hanno's Periplus, the marches of Xenophon and Alexander in Asia Minor, the operations before and after the battle of Cunaxa, Alexander's campaigns in Asia and India, the World according to Eratosthenes, Cæsar's wars, the wars of the Romans in Germany, the World according to Strabo and Pomponius Mela, the Roman Empire, the Periplus of the Erythræan Sea, the World according to Dionysius Periegetes and Ptolemy, and the British Isles and North-Western Africa according to Ptolemy.

Dodman, G. Sutherland.—A Voyage round the World in 500 days, with details . . . . giving an account of the principal parts to be visited, with a brief description of the scenery and all particulars connected with the undertaking. London (Mackie, Brewtnall & Co.): 1879, sm. 8vo., pp. 174, map, pls., price 2*s.* 6*d.*

Oliver and Boyd's Pronouncing Gazetteer of the World, Descriptive and Statistical, with Etymological Notices; being a Geographical Dictionary for popular use. Edinburgh (Oliver & Boyd) and London (Simpkin, Marshall & Co.): 1879, sq. 8vo., pp. 462, 32 coloured maps, price 6*s.* 6*d.*

Pfaff, F.—Der Mechanismus der Gebirgsbildung. Heidelberg (Winter): 1880, 8vo., pp. 143, woodcuts. (*Williams & Norgate:* price 5*s.*)

NEW MAPS.

(By J. Coles, *Map Curator* R.G.S.)

EUROPE.

Bavarian General Staff.—Generalstabskarte von Bayern. Scale 1:25,000 or 2·9 inches to a geographical mile. Photolitho. Sheets: 15, Markleuthen (East and West), 22, Tirschenreuth (East and West), 36, Preimt (East), 47 Dietfurt (West), 70 Dachau (East and West), 83 Wolfrathshausen (East). 1*s.* 6*d.* per sheet. (*Dulau.*)

Dépôt des Fortifications.—Carte de la France. Scale 1:500,000 or 6·8 geographical miles to an inch. Dépôt des Fortifications, 1879. Sheet II. "Lille." 1*s.* (*Dulau.*)

This is the first sheet published of this map, which was exhibited at the late Paris Exhibition, and is based upon that of the Dépôt de la Guerre 1:80,000; it is printed in four colours, and will be completed in 15 sheets, one of which is the title. Besides France it embraces the bordering countries, as is exemplified in this sheet "Lille," which comprises London, Boulogne, Dunkirk, Amiens, Roubaix, Tourcoing, Bruges, Tournay, Gand, &c.

Erdmann, Professor A.—Sveriges Geologiska Undersökning. Scales 1:50,000 or 1·4 inch to a geographical mile, and 1:200,000 or 2·7 geographical miles to an inch. Sheets: Lessebo, Ölmestad, Linderöd, Hjulsjö, Norrköping, and Möja. Stockholm, 1879. (*Dulau.*)

Petry, —.—Uebersichtskarte der Stadt Dortmund, 1879. Scale 1:10,000 or 7·2 inches to a geographical mile. Chromolith. Dortmund. 4*s.* 6*d.* (*Dulau.*)

Prussian Government.—Generalstabskarte von Preussen. Scale 1:100,000 or 1·3 geographical mile to an inch. Berlin, 1879. Engraved and coloured. Sheets: G No. 25, Neustadt in Westpreussen, 39 Lupow, 59 Rummelsburg, 97 Tempelburg, 117 Callies, 118 Deutsch-Krone, 141 Nakel, 258 Fritzlar. H 258 Melsungen. 1*s.* 6*d.* per sheet. (*Dulau.*)

—— Karte der Umgegend von Thorn. Scale 1:25,000 or 2·9 inches to a geographical mile. Königl. preuss. Landesaufnahme 1876. Herausgegeben 1879. 4 sheets, chromolith. Schropp, Berlin. 8*s.* (*Dulau.*)

ORDNANCE SURVEY MAPS.

6-inch—County Maps:—

England and Wales: Denbigh, No. 3, 2*s.* 6*d.* Sussex, No. 64, 2*s.* 6*d.*

Ireland: Cavan, Nos. 2, 2*s.*; 8, 2*s.*; 3, 2*s.* 6*d.*; 4, 2*s.*, revised. Westmeath, Nos. 30, 2*s.* 6*d.*; 31, 2*s.* 6*d.*; 36, 2*s.* 6*d.*; 37, 2*s.*; 38, 2*s.* 6*d.*, revised.

25-inch—Parish Maps:—

England and Wales: Berks: Childrey, 13 sheets, 35*s.* 6*d.*; Compton Beauchamp, 9 sheets, 24*s.*; Letcombe Bassett, 11 sheets, 30*s.* 6*d.*; Sparsholt, 19 sheets, 50*s.* 6*d.* Brecknock: Ystradfellte, 7 additional sheets, 17*s.* 6*d.*; Ystradgynlais, 6 additional sheets, 15*s.*; Defynog, part of, 3 sheets, 7*s.* 6*d.*; Penderyn, part of, 5 sheets, 12*s.* 6*d.* Carmarthenshire: Llanddensant, part of, 4 sheets, 10*s.* Glamorganshire: Barry, 4 sheets, 10*s.*; Cadoxton juxta Barry, 4 sheets, 11*s.* 6*d.*; Merthyr Dovan, 8 sheets, 21*s.* 6*d.*; Penmark, 10 sheets, 25*s.*; Porthkerry, 5 sheets, 12*s.* 6*d.*; St. Athan, 10 sheets, 25*s.*; Ystrad-dyfodwg, 1 additional sheet, 2*s.* 6*d.* Herts: Redbourne, 13 sheets, 34*s.*

Town Plans:—

ENGLAND: Staffordshire; Hanley, 10 feet scale, 6 additional sheets, 12*s.*
IRELAND: County Clare; Ennis, 10 feet scale, 24 sheets, 48*s.*

Index Map:—

ENGLAND: Hants, 2 miles to an inch, 2*s.* 6*d.*; with Area Book, 1*s.* 6*d.* (*Stanford, agent.*)

ASIA.

Indian Government Surveys.—Chingleput and Madras Districts: Map of the Chingleput and Madras Districts. Reduced from the Revenue Survey Maps. Chepauk, 1874. Scale 2 miles to an inch. On 3 sheets; size of each 40 inches by 27. With a list of taluqs; their population; chief towns; areas under Government, zemindari, &c.; extent of wet and dry cultivation.—Map of the Chingleput Taluq, Chingleput District. Reduced from the maps of the Revenue Survey, completed in 1873. By W. Beaumont, Esq., Deputy Superintendent. Chepauk, 1874. Scale 1 mile to an inch; size 36 inches by 66.—Map of the Conjeeveram Taluq, Chingleput District. Reduced from the maps of the Revenue Survey completed in 1872. By W. Beaumont, Esq., Deputy Superintendent. Chepauk, 1874. Scale 1 mile to an inch. On 2 sheets; size of each 40 inches by 27.—Map of the Madurantakam Taluq, Chingleput District. Reduced from the maps of the Revenue Survey completed in 1873. By W. Beaumont, Esq., Deputy Superintendent. Chepauk, 1874. Scale 1 mile to an inch. On 2 sheets; size of each 40 inches by 27.—Map of the Trivellur Taluq, Chingleput District. Reduced from the maps of the Revenue Survey completed in 1872. By W. Beaumont, Esq., Deputy Superintendent. Chepauk, 1874. Scale 1 mile to an inch. On 2 sheets; size of each 31 inches by 36.—Nellore District: Map of the Nellore District. Reduced from the Revenue Survey maps. Scale 2 miles to an inch. On 6 sheets; size of each 37 inches by 27. Chepauk, 1873. With a list of the taluqs; their population; chief towns; area under Government, zemindari, &c.; and the extent of wet and dry cultivation.—Map of the Atmakur Taluq, Nellore District. Reduced from the maps of the Revenue Survey executed in 1865. By Messrs. W. Beaumont and F. C. Puckle, Esq. (*sic*), M.A., Deputy Superintendent, Revenue Survey. Chepauk, 1873. Scale 1 mile to an inch. On 2 sheets; size of each 40 inches by 27.—Map of the Darsi Division of the Venkatagiri Zemindari, Nellore District. Reduced from the maps of the Revenue Survey completed in 1872. By W. Beaumont, Esq., Deputy Superintendent. Chepauk, 1874. Scale 1 mile to an inch. On 2 sheets; size of each 40 inches by 27.—Map of the Gudur Taluq, Nellore District. Reduced from the maps of the Revenue Survey completed in 1866. By H. Puckle, Esq., M.A., Deputy Superintendent. Chepauk, 1873. Scale 1 mile to an inch. On 3 sheets; size of each 40 inches by 27. With a list of villages.—Map of the Kandukur Taluq, Nellore District. Reduced from the maps of the Revenue Survey completed in 1869. By Major W. Barber, 33rd Madras Native Infantry, Deputy Superintendent. Chepauk, 1872. Scale 1 mile to an inch. On 2 sheets; size of each 40 inches by 27. With a list of villages.—Map of the Kanigiri Taluq, Nellore District. Reduced from the maps of the Revenue Survey completed in 1873. By Messrs. (*sic*) F. C. Puckle, Esq., M.A., and W. Beaumont, Esq., Deputy Superintendents. Chepauk, 1874. Scale 1 mile to an inch. On 4 sheets; size of each 23 inches by 23.—Map of the Ongole Taluq, Nellore District. Reduced from the maps of the Revenue Survey completed in 1866. By Major W. Barber, 33rd Madras Native Infantry, Deputy Superintendent. Chepauk, 1872. Scale 1 mile to an inch. On 2 sheets; size of each 40 inches by 27. With a list of villages.—Map of the Podilé Division, Venkatagiri Zemindari, Nellore District. Reduced from the map of the Revenue Survey completed in 1872. By W. Beaumont, Esq., Deputy Superintendent. Chepauk, 1874. Scale

1 mile to an inch. On 2 sheets; size of each 38 inches by 27.—Map of the Rapur Taluq, Nellore District. Reduced from the maps of the Revenue Survey completed in 1866. By F. C. Puckle, Esq., M.A., Deputy Superintendent. Chepauk, 1873. Scale 1 mile to an inch. On 2 sheets; size 38 inches by 27.—Map of portion of Polur Division, Venkatagiri Zemindari, Nellore District. Reduced from the maps of the Revenue Survey completed in 1873. By W. Beaumont, Esq., Deputy Superintendent. Chepauk, 1874. Scale 1 mile to an inch; size 40 inches by 27. —Map of the Udayagiri Taluq, Nellore District. Reduced from the maps of the Revenue Survey completed in 1873. By W. Beaumont, Esq., Deputy Superintendent. Chepauk, 1874. Scale 1 mile to an inch. On 4 sheets; size of each 25 inches by 20.—Map of portion of Venkatagiri Zemindari, Nellore District. Reduced from the maps of the Revenue Survey completed in 1873. By W. Beaumont, Esq., Deputy Superintendent. Chepauk, 1874. Scale 1 mile to an inch; size 35 inches by 39.—Indian Atlas Quarter Sheets. Sheet 53, S.E. Bhopal, Baitool [Betul], Hoshungabad [Hoshangabad], &c. Sheet 91, S.W. Raipur, Balaghat, &c. Sheet 93, N.W. Part of Bustar [Bastar].—Lower Provinces Revenue Survey. District Dinajpoor [Dinagepore]. Sheets 5, 6, 11. Scale 1 mile to 1 inch.—Lower Provinces Revenue Survey. District Fureedpoor [Furreedpore]. Sheets 6, 7, 8, 9, 10. Scale 1 mile to 1 inch.—Lower Provinces Revenue Survey. District Rungpoor [Rungpore]. Sheets 6, 7, 8, 9, 10, 11, 12, 13. Scale 1 mile to 1 inch. —North-West Provinces. Jaunsar Bawar, District Dehra Dun. In 4 Sheets. Sheet 2. Scale 2 inches to 1 mile.—North-West Provinces. Kumaun and Garhwal. Mandakani-Alaknanda River. Revised Survey of Boundary between North-West Himalaya and Kumaun and Garhwal Surveys, 1878. Scale 4 miles to 1 inch.—North-West Provinces. Portions of Western Hundes (Chinese) and Tihri [Tehri] Garhwal. Nilang and Gangotri Valleys. Scale 2 miles to 1 inch. —Rajputana Topographical Survey. Half Degree Sheet, No. XII., South, including Sheets 80, 81, 84, 85. Parts of Jodhpore and Bickaneer. Scale 2 miles to 1 inch.—Gwalior and Central India Topographical Survey. Scale 1 mile to 1 inch. Part of Oodeypore, including the City. Sheet 84.—Bhopal and Malwa Topographical Survey. Scale 1 mile to 1 inch. Parts of Bhopal, Gwalior, Indore, and Dewas. Sheets 22, 41. Khandesh and Bombay Native States Topographical Survey. Scale 1 mile to 1 inch. Sheets 19, 29, 31.—Guzerat [Gujarat], 1875–76. Scale 2 inches to 1 mile. Sheet 32, Section 1. Parts of the Broach and Ankleswar [Ankleshvar] Talukas of the Broach District, with portions of Rewa Kanta [Kantha] State, including the City of Broach and the town of Ankleswar [Ankleshvar].—Kattywar [Kathiawar]. Scale 1 mile to 1 inch. Sheets 40, 49. Parts of Barda and Sorath.—Great Trigonometrical Survey of India Preliminary Chart of the Madras Coast Series. Season 1877–78. Cauvery Delta.—The two routes to Kabul, viâ Jellulabad, and viâ the Kuram Valley, taken principally from the surveys and reconnaissances by Officers of the Survey of India 1878–79. Scale 4 miles to 1 inch. Size 44 inches by 30. (*Stanford, agent.*)

NOTE.—The names in brackets [ ] are authorised spellings. Parentheses ( ) denote additions to the titles by way of explanation.

Intelligence Branch, Quartermaster-General's Department:—

Reconnaissance Sketch of Kabul and its environs, made in 1842, by Captain F. Abbott, Bengal Engineers. Scale 1 : 15,840 or 4 inches to 1 mile. Intelligence Branch, Quartermaster-General's Department, 1879.

Map of the country around Kábal and Ghazni, with the routes leading to India. Scale 1 : 250,000 or 3·4 geographical miles to an inch. 1879.

Plan of the country around Kandahar. Surveyed by Major Garden and Captain Paton of the Quartermaster-General's Department in May 1839. Scale 1 : 36,500 or 1 inch to half a geographical mile. 1879.

Plan of Herat Fort. Scale 400 feet to 1 inch. Lithographed from a copy drawn in the Chief Engineer's Office, Fort William, June 1842, at the Surveyor General's Office, Calcutta. February, 1879.

Plan and Sections of Ghuznee. Scale of Plan 50 yards to 1 inch. Scale of Sections 50 feet to 1 inch. 1879.

Routes from Quetta and Kalat-i-Ghilzae, to Ghazni. Scale 1 : 250,000 or 3·4 geographical miles to an inch. Compiled and drawn in the Office of Quartermaster-General in India. Simla, November 1878.

Map of Burmah, compiled in the Intelligence Branch, Quartermaster-General's Department, September, 1879. Scale 1 : 1,000,000 or 13·6 geographical miles to an inch. Intelligence Branch, Quartermaster General's Department, War Office, London, 1879.

AFRICA.

Hassenstein, B.—Dr. W. Junker's Reisen in Nordost- und Central-Afrika. Blatt No. 1. Karte der Routen in den Mudirien Ladó und Makaraká sowie in das Quellgebiet des Jeï und Uëlle. Januar 1877 bis Februar 1878. Mit Benutzung einer Routenconstruction von W. H Fritzche entw. w. gez. von B. Hassenstein. Scale 1 : 750,000 or 10·3 geographical miles to an inch. Petermann's 'Geographische Mittheilungen,' Jahrgang 1879, Tafel 23. Justus Perthes, Gotha. (*Dulau.*)

Intelligence Branch, Quartermaster-General's Department:—

Sketch Map of a portion of the Transvaal, showing Sekukuni's Territory. Scale 1 : 633,600 or 8·6 geographical miles to an inch. December 1879.

Sketch of the Lulu (Leolu) Mountains, Sekukuni's Territory. Scale 1 : 253,440 or 3·4 geographical miles to an inch. Compiled and lithographed at the Intelligence Branch, Quartermaster-General's Department, December 1879.

Kiepert, Richard.—Die Südliche Hälfte des Congo-Beckens. Zur Uebersicht der bisherigen Entdeckungsreisen, insbesondere derer von Dr. P. Pogge, Oberlieut. Lux und Dr. H. v. Barth. Nach den Skizzen, Aufnahmen und Tagebüchern dieser Reisenden und allen veröffentlichen Materialien gezeichnet von Richard Kiepert. Dietrich Reimer, Berlin, 1879. Scale 1 : 3,000,000 or 41·6 geographical miles to an inch. (*Dulau.*)

As might be inferred from the title of this map, the greatest interest attaches to those portions of it which show the results of the explorations of Dr. P. Pogge, Oberlieut. Lux, and Dr. H. v. Barth. Though each of these explorations has been the means of filling up some of the blanks which existed in our maps of the southern portion of the Congo Basin, yet it is probable that the greater interest will be centered on the journey of Dr. Pogge, who succeeded in reaching Quizememe in latitude 9° 17′ S., and longitude 23° 8′ E.; this place has never before been visited by any white man and (save by name) was only known to very few of the coloured traders of Bihé. By comparing this map with Keith Johnston's map of Africa, 1879, it will at once be seen how much has been added to our geographical knowledge of this region by Dr. Pogge's explorations. The nearest approaches to the most northern point in Molua reached by Dr. Pogge, are those of the Pombeiros, who reached Kifembo, 30 miles south of Quizememe, and Graça, who reached within 10 miles of the latter place.

The Eastern portion of Molua, which was travelled over by Dr. Pogge, and which is laid down in this map, is entirely new.

It is to be regretted that the routes of different travellers (fourteen of which are laid down in this map) are not distinguished from one another in a more decided manner, the tints in some cases being so similar that they would be of but little service to any person who had not previously a somewhat correct idea of the route followed by any particular traveller.

AMERICA.

U.S. Geological and Geographical Survey of the Territories:—

Part of Central Wyoming; surveyed in 1877. Scale 1:253,440 or 3·4 geographical miles to an inch. George B. Chittenden, C.E., Topographical Assistant.

Parts of Western Wyoming, South-Eastern Idaho, and North-Eastern Utah; surveyed in 1877. Scale 1:253,440 or 3·4 geographical miles to an inch. Henry Gannet, M.E., Topographical Assistant.

Parts of Western Wyoming, and South-Eastern Idaho; surveyed in 1877 & 78. Scale 1:253,440 or 3·4 geographical miles to an inch. G. R. Bechler and Fred. A. Clark, Topographical Assistants.

Yellowstone National Park; surveyed in 1878. Scale 1:126,730 or 1·7 geographical mile to an inch. Primary triangulation by A. D. Wilson. Secondary triangulation and topography by Henry Gannet, M.E.

Drainage Map, showing portions of Wyoming, Idaho, and Utah. Scale 1:500,000 or 6·8 geographical miles to an inch. Primary triangulation by A. D. Wilson. Topography by Henry Gannet, G. B. Chittenden, G. R. Bechler, and F. A. Clark. April 1879. Department of the Interior, U.S. Geological and Geographical Survey of the Territories. F. V. Hayden, U.S. Geologist in charge.

These five maps are the result of the work of the U.S. Geological and Geographical Survey of the Territories, during the years 1877 & 78. The map of the Yellowstone National Park is on a scale of 1·7 geographical mile to an inch, with contour intervals of 100 feet. It is intended that these maps should be coloured to show the Geology, &c., before their final publication; 11,000 copies of each have been printed, 1000 copies on thick paper, which will be published in atlas form when the Geological and Economical sheets are completed.

CHARTS.

Admiralty.—Charts published by the Hydrographic Department, Admiralty, in September and October 1879.

No.	Size.		Inches.	
882	$\frac{\text{DE}}{2}$ m	=	6·0	England, south coast:—Tamar river. 1*s.* 6*d.*
1559	$\frac{\text{DE}}{2}$ m	=	various.	Adriatic sea:—Ports and anchorages in Istria. 1*s.* 6*d.*
928	DE m	=	0·16	Eastern archipelago:—Sulu archipelago (plans, Sulu roadstead, Maimbun and Lamenusa anchorages). 2*s.* 6*d.*
201	DE and DE m	=	0·5	Adriatic sea:—Gulfs of Venice and Trieste, from the mouths of the river Po to Cape Promontore. 4*s.*
2364	DE m	=	0·55	Baltic:—Lubeck bay and Femern belt (plan, Trave river). 2*s.* 6*d.*
2762	DE m	=	0·06	Indian ocean:—Comoro islands, with the adjacent coasts of Africa and Madagascar (plans, Fumboni bays and road; Numa Choa anchorage; Johanna road; Pomony harbour). 2*s.* 6*d.*
1258	A m	=	0·4	Korea, west coast:—Approaches to Séoul. 2*s.*

No.	Size.	Inches.	
897	$\frac{DE}{2}$ m =	0·28	Africa, west coast:—Milkbosch point to Orange river (plan, MacDougall harbour). 1s. 6*d*.
1001	$\frac{DE}{2}$ m = m =	0·86 2·50	Africa, west coast:—St. Louis or Guet-n'dar anchorage and Senegal bar. Goree road and harbour. 1s. 6*d*.

No. 1640. Plan of Vy-Py Hay removed, and plans of Hana-Menu, Hana-Japa, Hana-Vave, and Taa-Hu-Ku added. No. 1033. Plan of Jurien bay added.

CHARTS CANCELLED.

No.		Cancelled by	No.
1909	St. Nicholas island, &c. ..	New plan. Anchorages on the coast of Lower California	1924
1559	Umago, port	New plan. Ports and anchorages in Istria	1550
1564	Quieto and Cittanova, ports ..		
1566	Lemo canale		
1568	Parenzo, port		
2576	Sulu archipelago	New chart. Sulu archipelago	928
928	Sigboyé and Sibutu passages ..		
2364	Lubeck bay and Femern belt	New chart. Lubeck bay and Femern belt	2364
2762	Comoro islands	New chart. Comoro islands	2762
1258	Séoul and Salee rivers	New chart. Approaches to Séoul	1258
1001	St. Louis or Guet-n'dar and Senegal bar	New plan. St. Louis or Guet-n'dar and Senegal bar. Goree road and harbour ..	1001

Danish Hydrographic Office.—Grönland med Omgivelser, ifölge Graah, Scoresby, Giesecke, Ross, Parry, Egede, Danell, Hall, Pickersgill, Ginge og van Keulen. Scale 1:2,750,000 or 37·6 geographical miles to an inch. Danish Hydrographic Office, Copenhagen.

In this chart, which was originally published in 1832, but which is brought up to date, some important additions have been made in the southern part of the east Coast of Greenland, which serve in some measure to connect Scoresby's most southern point in 69° N. (1822) with the most northern point reached by Captain Graah of the Danish Navy in latitude 65° 18′ N. (1828). The Danish schooner *Ingolf*, Captain Mourier, which has been stationed at Iceland, having sailed for the coast of Greenland in July 1879, was enabled to approach sufficiently close to fix with precision the positions of some mountains southward of Scoresby Land, which has enabled the Danish Hydrographic Office to fill up, in part, the hitherto existing blank on this part of the coast of Greenland. On the Charts which have been presented to the Society, by the Danish Hydrographic Office, are laid down in manuscript the track of the *Ingolf* as well as the position of the ice barrier, which latter corresponds in a very striking manner with the track of the crew of the German ship *Hansa*, which was crushed in the ice, and who, it will be remembered, drifted 1100 miles on a field of ice, between the months of October 1869 and May 1870, at one time approaching very close to the Greenland coast in latitude 67° N. Among other corrections in this chart is that of the position assigned to the mountain, now called Mount Ingolf: it would seem that in 1786 this same mountain was seen by Admiral Löwenörn, but the distance assigned by this officer appears to be in error, as from the fact that Mount Ingolf is on the same line of bearing there can be but little doubt that the mountain, which has been seen by both the officers, is one and the same; and as the *Ingolf* actually sailed over the position assigned to it by Admiral Löwenörn, it is evident that that officer had formed a wrong estimate of its distance.

Marine Survey of India.—Charts Nos. 27, Veráwal (Verrole) roads, 2s. 137, Preparis, North Channel, and entrance to Bassein river, 2s. 1179, Lacon Bight to Lem Chong P'ra, 2*s*. 1191, Rajapur Bay and Viziadurg, 2*s*. Published at the Marine Survey Department, Calcutta, 1879, under the direction of Commander A. D. Taylor, I.N., Superintendent of Marine Surveys.

ATLASES.

Steinhauser, A.—Das Planeten System unserer Sonne nach Littrow's und Arago's Angaben von A. Steinhauser. 1*s*. 9*d*.

—— Die Himmels-Planigloben. Artaria and Co. Vienna, 1879. 1*s*. 9*d*. (*Dulau.*)

These two sheets form a portion of 'Scheda-Steinhauser's Hand-Atlas der neuesten Geographie' 24 sheets, in addition to which are given the following maps of Mathematical Geography:—1. Die Himmels-Planigloben (nördl. und südl. Halbkugel). 2. Aequatorialzone der Himmelskugel (Positionen 1850 nach Mädler). 3. Das Planeten-System. 4. Sonne und Mond, Mondkarte. 5. Erdstellungen, Ellipse der Erdbahn. 6. Projectionen, Zusammenstellung von mehr als 30 Projections-Methoden.

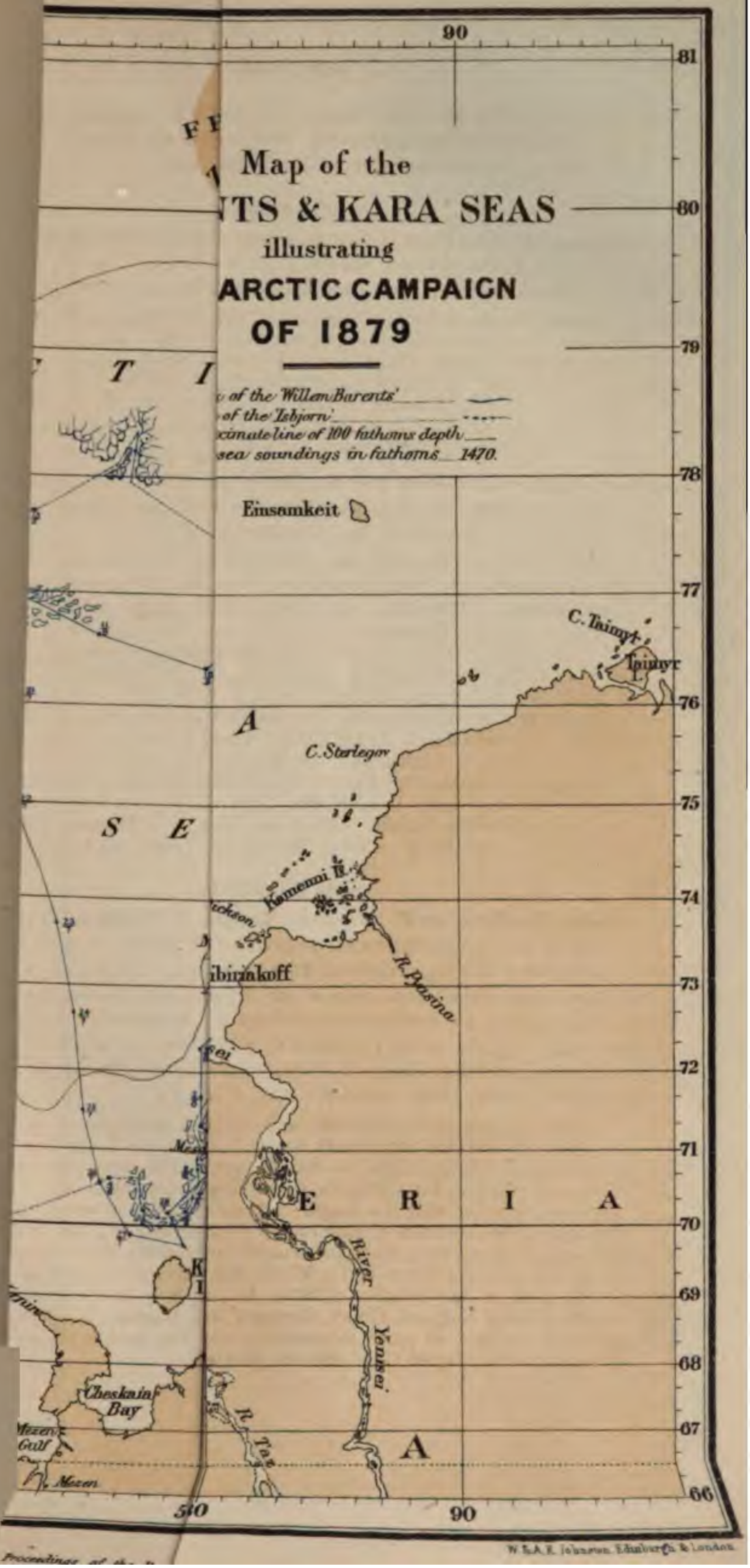
Stieler, Adolf.—Hand-Atlas über alle Theile der Erde. Neu bearbeitet von Dr. August Petermann, Dr. Hermann Berghaus und Carl Vogel. 10 Lieferung. Justus Perthes, Gotha, 1879. 2*s*. (*Stanford.*)

The contents of the 10th Part of the new edition of Stieler's Hand-Atlas are as follows:—No. 11. Süd-Polar-Karte. Von A. Petermann. 1:40,000,000. Nebenkarten. Übersicht der Nord-Polar-Regionen bis 30° S. Br., 1:170,000,000. Übersicht der Nord-Polar-Regionen bis 30° N. Br., 1:170,000,000. Süd-Shetland und Süd-Orkney-Inseln, 1:10,000,000. Victoria-Land, 1:10,000,000. Süd-Georgien, 1:5,000,000. Crozet-Inseln, 1:3,000,000. Prinz-Eduard-Inseln, 1:3,000,000. Kerguelen-Inseln, 1:2,000,000. Auckland-Inseln, 1:2,000,000. Warekauri-Inseln, 1:2,000,000. Tristan da Cunha-Insel, 1:1,000,000. Insel New-Amsterdam, 1:1,000,000. Insel St. Paul, 1:1,000,000. Deception-Insel, 1:1,000,000. Insel Juan Fernandez, 1:1,000,000. No. 41. Spanische Halbinsel. Blatt 3. Südöstlicher Theil. Von C. Vogel. 1:1,500,000. No. 81. West-Indien, Central-Amerika bis zum Südlichen Canada. Blatt 3. Von A. Petermann. 1:7,500,000. Nebenkarte: Das Gebiet zwischen Mexico und Vera-Cruz, 1:2,000,000.

EDUCATIONAL.

Levasseur, E.—Terre, par E. Levasseur, Membre de l'Institut. Dressée avec le concours de A. Lejeaux, dessinateur géographe. Échelle de la Carte à l'Équateur, 1:25,000,000 or 341·3 geographical miles to an inch. La projection de Mercator, sur laquelle est dressée cette carte, et sur laquelle sont dressées toutes les cartes marines, agrandit les surfaces à mesure qu'on s'approche des pôles, et, sous le 70^{me} degré, l'échelle est de 1:8,940,000, c'est-à-dire un millimètre pour 8940 mètres. Institut Géographique de Paris. Ch. Delagrave, Éditeur de la Société de Géographie. Paris, 1879. 4 sheets. 14*s*. (*Dulau.*)

This is a map of the Physical and Political geography of the World, the Physical features are very clearly shown. There are 7 diagrams which show the comparative areas of the oceans, continents, and their populations, human races, and religions, the commerce of the several continents and their principal divisions, together with the length of their existing railways; in addition to these, are given contours of each of the great divisions of the earth, sections of the ocean bottoms, rain, wind, and temperature charts; the comparative lengths of all the principal rivers of the World, the principal projects of interoceanic canals, plan of the Isthmus of Suez, &c., as well as the different scales of measurement of England, France, Germany, and Russia. It is seldom that any one map contains so much information, and the bold style in which it is coloured is well adapted for educational purposes.


Map of the
NTS & KARA SEAS
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OF 1879
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of the Isbjorn'
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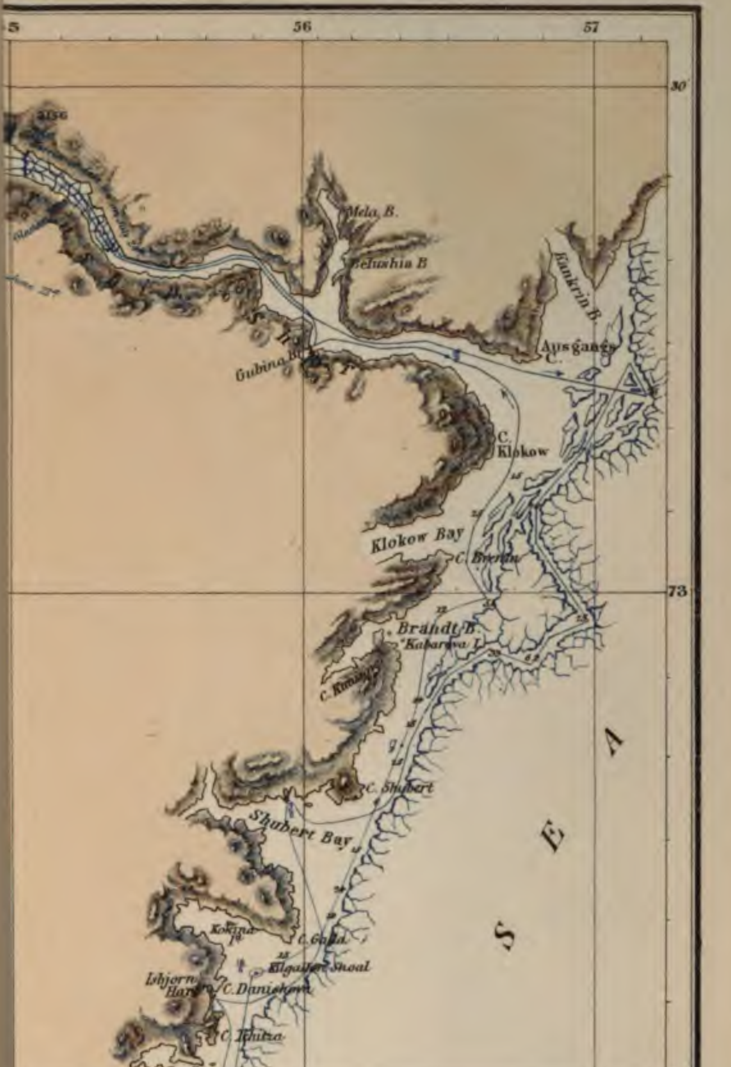

W & A.K. Johnston, Edinburgh & London.

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PROCEEDINGS

OF THE

ROYAL GEOGRAPHICAL SOCIETY

AND MONTHLY RECORD OF GEOGRAPHY.

A Visit to Jebel Shammar (Nejd). New Routes through Northern and Central Arabia. By Wilfrid Scawen Blunt.

(Read at the Evening Meeting, December 8th, 1879.)

Maps, p. 144.

It is now nearly sixteen years since the attention of this Society was last directed to the Arabian Peninsula—to that part of it, at least, which is distinguished from the districts bordering on the sea-coast by the name of Nejd. Indeed, since Mr. Palgrave and Colonel Pelly visited Riad in 1863 and 1864 no European traveller that I am aware of has turned his steps in this direction; and Central Arabia has returned in some measure to its old position of an almost fabulous land, one whose real nature is still a matter of doubt, if not of curiosity. It was to satisfy my own doubts and my own curiosity that I undertook a journey last winter, in company with my wife, Lady Anne Blunt, from Damascus southwards to Jof and the Jebel Shammar.

The circumstances of our expedition were as follows:—In the winter of 1877–78 I had spent some months in the northern deserts bordering the Euphrates, and had made acquaintance with most of the great Bedouin sheykhs on either side of the river, and especially with Sotamm ibn Shaalan, the head of the Roala, the most considerable tribe in the western half of the Hamad. I felt myself therefore to a certain extent "free" of the northern desert, and was able to travel with more security than a casual stranger could have counted on. I had, besides, secured the services, as travelling companion, of one whose birth and position would serve me for an introduction further south. This was Mohammed ibn Aruk, eldest son of the Sheykh of Palmyra. My friendship with him and the peculiar circumstances of his family history were indeed the key-note of my whole journey, and as such deserve mention.

It appears that about one hundred and thirty years ago, at the time of the foundation of the Wahhabi empire, three brothers of the Ibn Aruk family, a well-known name in Nejd, left Aared, their native country, in search of adventures, or in disgust at the new *régime*. A ballad still popular in Arabia narrates the circumstance, and describes them as setting out all three mounted on one camel, with nothing but their swords and their noble birth to gain them a living. They travelled together as far as Jof, and then after some time they separated; the elder remaining at Jof, the second going still further northwards and settling at Palmyra, while the third disappeared tradition knew not whither. From the second brother my friend was descended, and though no communication had been kept up between the families during these one hundred and thirty years, Mohammed was aware by tradition of the existence of his cousins in the south. Now, it happened that Mohammed had a wish, a very common one among Arabs, of taking a wife from his own people, and he had often spoken to me of his intention of going some day to Nejd and finding out his relations there; and I, seeing in this an excellent opportunity of making the journey I intended, encouraged him to accompany us, by the promise of helping him to choose a wife and paying her dower, no small matter to a poor man. To this he readily assented, and when I left Damascus to return to England it was with the understanding that he should meet me again in the autumn, and that we should make the intended journey together. As a preliminary, we took the customary oath of brotherhood, by virtue of which we should be bound to stand by each other in case of danger on the road, and so we parted.

On my return to Damascus last winter I found that Mohammed was waiting for me there, and that he had made the necessary purchases of camels for the expedition, and procured the services of a couple of Tudmuri to act as drivers. I had therefore little more to do than to purchase provisions, and in less than a week we were fairly on our way southwards.

Our first visit was to Mezarib, on the pilgrim road south of Damascus, where a fair was being held, and where we hoped to find some one willing to serve us as guide down the Wady Sirhan, but in this we were disappointed; and after beating about for some time in search of a capable conductor, we crossed the Hauran Hills by Bozra and Salkhad to Melakh, where Mohammed had an acquaintance in Huseyn el Atrash, a Druse sheykh, who had been intimate with his father. Mohammed's father, Abdallah ibn Aruk, had formerly been contractor for the Syrian pilgrimage, and as such was well known to many of the sheykhs of the Hauran, and Huseyn received us with the utmost cordiality.

The town of Melakh, interesting as it is, is too well known to need description. It is the extreme frontier town of Syria, and beyond it there are no settled habitations eastwards, or cultivated land. There is a belief prevalent among the inhabitants of this district that the Roman road, which is still traceable for some miles in a south-east direction from Salkhad, was continued all the way to Bussora on the Euphrates.

But this, I am convinced, has no foundation in fact. It is highly improbable that it was ever carried further than Ezrak.

After enjoying Huseyn's hospitable entertainment for two days, we were sent on by him to a Bedouin sheykh of the Beni Sokhr tribe, Ali el Khreysheh, with whom Huseyn was on terms of friendship, and to whom he gave us letters. By him we were in turn forwarded to Kaf, a small oasis on the edge of the Wady Sirhan.

Ali el Khreysheh's camp was about 30 miles to the south-east of Melakh, in the middle of a vast plain strewn with volcanic boulders: this is called the Harra, and it extends southwards at least as far as latitude 32°. It is a black, gloomy region, across which it is difficult to travel with camels, on account of the narrowness and intricacy of the paths which wind in and out among the boulders. It is the traditional home of the Beni Sokhr, the "children of the rocks," who state that they have lived there "from all time." It is traversed from north to south by a considerable wady, which drains the eastern slopes of the Hauran into the Wady Sirhan. This is called the Wady er Rajel, and is a well-known watering district in an otherwise thirsty land. We followed it almost to its junction with the Wady Sirhan, and then, quitting the district of black stones, crossed an open plain of gravel south-eastwards to Kaf.

Kaf and its sister oasis Ittery, six miles to the E.S.E., are two insignificant villages of ten and twelve houses each, with some three acres of palm gardens enclosed by low walls. The inhabitants are in occasional communication with Bozra, by means of the salt caravans, which take in the produce of the *subbkha* of Ittery, and return with corn. They acknowledge Ibn Rashid, the Emir of Jebel Shammar, as their suzerain, paying him a yearly tribute of 4*l.* for each village. They are also tributary to Ibn Shaalan and Mohammed ibn Smeyr, sheykhs of the Roala and Welled Ali. The villages have a flourishing look, as far as such small places can; and I noticed newly planted palm and *ithel* trees, always a sign of prosperity in Arabia. The houses were of the Nejd type, square and surmounted with little battlemented towers. At Ittery there are the remains of a stone building, over the door of which I made out an inscription in the Himyaritic character. We were well received at both places and were provided by the sheykh of Ittery, who was married to one of Mohammed's Jof cousins, with a Sherari guide.

From Kaf to Jof, a distance of over 200 miles, there is no inhabited place, nor is the Wady Sirhan frequented by any human beings except during the summer, when the wells which are plentiful along its whole course, attract the Bedouins. There is no communication, except at rare intervals, between Kaf and Jof; and the Wady has the reputation of being at all seasons very unsafe travelling. Of this we presently had an instance. On the eighth day from Kaf, having seen no living creature except a few hares and gazelles and one hyæna, we were suddenly attacked by a band of horsemen. Lady Anne and I happened to be separated from the rest of our party, and were sitting under a ghatha bush eating our midday meal of dates, when we suddenly heard the galloping of horse-hoofs in the sand. Looking up we saw a dozen Bedouins bearing down on us with their lances; and we made a rush to get on our mares and rejoin our caravan. We should have probably succeeded in this but for the accident of Lady Anne's having sprained her knee the day before in dismounting from her camel, and now in the act of mounting her knee gave way. In another instant they were upon us; Lady Anne was knocked down by a lance, and I had the stock of a gun broken over my head, but fortunately we were neither of us hurt. Our thick cloaks saved us from the points of the lances, and my Bedouin head-rope saved my head; and when we had cried "dahil," "I yield," and given up our mares, they left off knocking us about. It then turned out that our captors were a party of Roala, friends of our own and of Mohammed's, though they knew nothing of us personally; and after we had sworn to our identity, they brought us back our mares and everything that had been dropped in the scuffle. They did this cheerfully enough, though with evident regret, for the mares were good ones. We then all sat down and ate dates and drank water together, and they told us that they were out on a scouting expedition, and had come across our track in the sand and followed it. It was an accident their having found us separated from our party, and they were amused and a little ashamed at finding they had been engaged against a woman. They had had no time, however, to ask questions, and the cloak which Lady Anne wore over her riding habit very well excused them. They were well-bred men, as all the Roala are; but it was lucky for us that they were friends not enemies, as by desert law they would have had a right to plunder us of everything we possessed, and leave us to find our way on foot out of the desert. Two days more brought us without further accident to Jof.

Jof is a town of about 500 houses, with palm gardens two miles by half a mile long—the whole enclosed by a wall ten feet high of sun-dried brick. Its only building of stone is the castle of Mared, which is now in ruins. This stands inside the town, and not at a distance as has been stated. The land outside the walls is absolutely desert except where an acre or two has been irrigated from wells and sown with barley, and where occasionally a small garden has been planted. All the corn consumed at Jof is brought from the Euphrates by the Sherarat and other Bedouins who take dates in exchange. There are no horses, asses, or other beasts of burden in the oasis, a few camels only being kept to draw water from the wells.

Meskakeh, a very similar but more important oasis, 22 miles distant to the north-east, contains 600 houses, and is a flourishing place. Its palm gardens may be three or four times larger than those of Jof, and it is surrounded by a good many detached farms and plantations. It also has a stone castle, perched upon a rock.

Besides these two towns there is Kara, a village of eighty houses, 10 miles south of Meskakeh; and it is possible that one or two other such may exist, though I heard nothing of them. The total population, however, of the whole Jof oasis cannot be placed higher than 7000 inhabitants. Mr. Palgrave computed it at 28,000. The whole is governed by a lieutenant of Ibn Rashid's, supported by some twenty soldiers who live in a castle outside Jof and keep excellent order through the district.

Jof, though for a time annexed like all Northern Arabia to the Wahhabi empire, was for many years considered the appanage of the Roala sheykhs, and it still pays tribute to Ibn Shaalan. But about twenty years ago it was conquered by Abdallah ibn Rashid, and has since formed part of the Shammar dominions. Mr. Palgrave's account of this event I found very generally confirmed. Since his visit, however, there has been an unsuccessful revolt on the part of the Jofi, which was put down by Metaab ibn Rashid, brother of the present Emir, and a few years later the district was invaded by a Turkish contingent, sent from Damascus. This occupied Jof without opposition; but later, upon representations being made by the Emir to the Sultan's government, it was ordered to withdraw. The expedition had been undertaken in connection with Midhat Pasha's schemes of conquest on the Persian Gulf. The inhabitants of Jof and Meskakeh, though previously ill-disposed to Ibn Rashid's rule, now recognise its advantages as having freed them from the Turks.

At Meskakeh we found those relations of Mohammed's we had been in search of, and stayed with them some days in the farmhouse they inhabit near the town. The Ibn Aruks of Jof are amiable, well-bred people, but hold no official position. We were fortunate enough to find among them a young lady of marriageable age for Mohammed; and Lady Anne, who conducted the negotiations, arranged a betrothal satisfactorily. Before we left, a marriage contract was signed between the parties, and the dower paid to the girl's parents, the sum agreed upon being 40*l.* I made a present of this to Mohammed, and it was determined that he should come again in two years' time to fetch home his bride. It would have been considered very incorrect to ask for an immediate wedding, for long engagements are the rule in Arabia, and patience is considered there the distinguishing virtue of noble minds. So Mohammed, who was anxious to prove himself a man of good breeding, agreed to wait, and in the meanwhile to pay a visit with us to Ibn Rashid at Hail.

On the 12th of January accordingly, having gained the consent of Johar, Ibn Rashid's vakil at Jof, to our plan, and procured the services of a guide, we left Meskakeh to cross the Nefud. This we accomplished in eleven days, and did so without the loss of a single camel, though I believe that ours is the first heavily laden caravan that has attempted the feat. The weather, however, was most favourable, and a heavy thunderstorm laid the sand for us during a part of the distance, making it firm walking for the beasts. I put it, as the crow flies, at 40 miles from Meskakeh to Shagik, from Shagik to Jubbeh 102 miles, and from Jubbeh to Igneh, the first village in Nejd, at 47 miles, the whole of this in heavy sand, which with the constant ups and downs and circuitous detours cannot make the total distance travelled much less than 200 miles.

With regard to the physical conditions of the Nefud, I find them so utterly at variance with all descriptions hitherto given, that I shall treat the matter separately at the end of this paper.

The rocks of Aalem, like those of Jof, Jubbeh, and indeed all the outlying peaks north and east of Jebel Aja, are of sandstone, varying in colour from yellow to red and purple, but weathered black on the upper surface. On many of these I discovered letters, in the character which is, I believe, now called Phœnician, together with the conventional drawings of camels, ibexes and goats usually found accompanying them. Some of these are sufficiently ancient to be now included in the black weathering of the rocks. Others appear more modern. I also found one inscription in old Arabic, but nothing that could suggest Classic or Christian times. The cross, which constantly occurs in Phœnician inscriptions, is evidently no more than a letter of the alphabet. Others in the same way resemble Greek. I have copied several of these. On the Jebel Shammar itself, which is of red granite, I found but one inscription, and that in Arabic. The character of these Shammar mountains, and their vegetation, is precisely that of Mount Sinai. They appear to be about 2000 feet above the level of the plain, and as that runs up beyond Hail to 4000 feet, I cannot put the highest point of the range at less than 6000 feet above the sea.

It is a mistake to suppose that Hail and the villages near it stand upon the southern slope of the Jebel Aja; the fact is that the granite range ends abruptly at this point, and is not continued eastwards. The watershed of the country seems, indeed, not to be determined by the Jebel Aja or the Jebel Selman, which rise abruptly out of the plain, but by the plain beyond; though I think it quite possible that Kasim and Aared may not really lie at a much higher level than the plain at Hail. The wady, in which Hail, Kefar and the other villages of Jebel Shammar lie, is a very shallow one, and can drain but a small area. It runs from south to north, and disappears in the Nefud.

As we approached Hail, we began for the first time to doubt how we might be received there. Mohammed ibn Rashid, the reigning Emir, came to his throne by violence, and has not altogether a pleasant reputation in Arabia. We learned from Rathi, our guide, many details of his crimes, which were anything but reassuring. He had stabbed his nephew, the late Emir, and caused the heads of sixteen of his relations to be cut off. But it was said that he was sorry for all this, and in the matter of his general administration of the country all agreed to praise him. As it turned out, however, we needed to be under no apprehension; for, having sent our guide on to announce us, he presently returned with the intelligence that the Emir was delighted at our arrival, that a house was preparing for our reception, and that we were to consider ourselves his guests at Hail. So in effect it turned out. The Emir, whatever his past history may have been, received us with the greatest kindness, and during the eight days that we spent with him, did everything in his power to amuse and interest us. He showed us his various houses and gardens, his menagerie, and his stud of horses. The latter interested us in a special degree, as besides having at the present day the reputation of being the best in Arabia, it represents that celebrated stud of Feysul ibn Saoud's described by Mr. Palgrave. The Wahhabi empire is now almost at an end, and the chief power in the peninsula has passed from Ibn Saoud to Ibn Rashid, and with the chief power, this stud.

Mohammed ibn Rashid possesses at the present moment in Hail sixty brood mares, eight stallions, and some fifty colts and fillies. All these are of the best strains of blood, the most notable being the Keheilan el Khrush and the Hamdani Simri. Besides these, he is said to have a couple of hundred more dispersed among his tribe in the Nefud. These mares, which have been collected from all quarters of Arabia but principally from the tribes of Aared, have many fine points, but less beauty than I had expected to find. They are few of them over thirteen hands two inches in height, and to my eye they cannot be compared with the best specimens I have seen among the Gomussa. It is a curious fact that the handsomest mare in the collection, and the one most highly prized, proved on inquiry to be a Keheilet Ajuz, bred by the Shammar of Mesopotamia. The Emir pointed us out with pride one or two animals, as having come from the Anazeh. My own mare, a Keheileh ras el Fedawi from the Fedaan, was universally admired at Hail for her quality and good looks. But I have not space here for disquisition. I will state only that, after a careful study of the question, I am convinced that there is no special virtue in the horses of Nejd as compared with those of the Northern Bedouins, and that the tale of a distinct "Nejd" breed is entirely fabulous; moreover, horses of any kind are exceedingly rare in Nejd. I believe that I am not exaggerating facts when I say that it would be possible to travel from one end of the peninsula to the other without having seen a single horse, or having crossed so much as a single horse-track.

The camel is the universal means of locomotion with the Bedouins. The townsmen go on foot.

Besides his stud, the Emir showed us as a special favour his stronghold in the Jebel Aja, which he is said never to have shown before to strangers. It is a place of immense natural strength, and has been made stronger still by art. In its present form it is the work of Obeyd ibn Rashid, Mohammed's uncle. I am sorry that I am not able to point out its position; but I feel that, in the face of possible Turkish aggression, I should not be justified in doing so.

The political and social condition of Nejd have been so admirably described by Mr. Palgrave, that very little remains for me to say. The system of government pursued by Abdallah and Tellal ibn Rashid has been ably continued by their successor Mohammed, the range of the Ibn Rashid influence having been moreover extended by him. At the present moment the Emir of Jebel Shammar is by far the most powerful personage in Arabia. The Wahhabi empire is now definitively broken up; and Wahhabism itself, already confined to Aared, has little prospect of long maintaining its position even there against the natural tendency of the Arab mind, which is extremely intolerant of religious trammels. Kasim and Jebel Shammar no longer acknowledge any allegiance to Ibn Saoud nor adherence to the Wahhabi tenets. In the Emir's palace at Hail I was allowed to smoke openly; and, though tobacco is not in common use among the Shammar, their abstinence seems more a matter of taste than of religious prejudice. An old Wahhabi sheykh of Harik, Nassr ibn Hezani, who was on a visit to Ibn Rashid, used constantly to accept my pipe, when, according to Arab custom, I handed it on to him.

The *Mejliss*, or public court of justice, is still held daily by the Emir in the palace-yard, where he appears, just as Mr. Palgrave describes his predecessor, surrounded by officers of state and a body-guard of eight hundred soldiers. It is, however, an exaggeration to speak of Ibn Rashid as "King," for this is a title which has not yet been assumed at Hail. By the townspeople he is addressed as Emir, by the Bedouins simply as Sheykh.

Murder and robbery, owing to the vigorous system of repression pursued for many years, are crimes almost unknown in Northern Nejd; and an honest traveller may pass with impunity along any of the caravan tracks which connect its towns and villages. Strangers, however, without visible means of existence and found at a distance from the highways, are treated as vagabonds, and in extreme cases as robbers. If there is any suspicion of their honesty, they are liable to the loss of a hand; if proved guilty of robbery they are beheaded. The only criminal, in fact, still unpunished in the Emir's dominions is the Emir himself; and his crimes, as political ones, have a certain sanction in public opinion among his subjects. A sketch of recent history in Hail may not be out of place.

On the death of Tellal ibn Rashid, who went out of his mind and committed suicide in 1864, his brother Metaab succeeded to the *Sheykha* and reigned for three years. The principal event, for which his name is remembered, is the suppression of the revolt in Jof, where he built the new castle outside the walls. Metaab died unexpectedly in 1867, while his younger brother Mohammed was absent from Hail. Mohammed had been for some years Emir el Haj—Prince of the Pilgrimage—a position of honour and emolument, but one which kept him out of the sphere of Hail politics; and he was travelling with the pilgrimage when his brother's death occurred. In his absence Bender, Metaab's nephew and son of the late Emir Tellal, was made Sheykh, being, I believe, supported by Obeyd, his great-uncle, a man of immense influence among the Shammar. At this Mohammed was very angry, and remained, as they relate, for two years with his *kefiyeh* over his face, and spoke to no one. He took up his abode at Riad, and refused all his nephew's proposals of reconciliation. At last Obeyd died (of paralysis), and Mohammed returned to Hail. There he commenced intriguing with the Bedouins with a view to supplanting his nephew. He affected to take the tributary tribes especially under his protection, and this led to the accident which gained him at last his ends. On one occasion he had brought a caravan of Sherarat to Hail without the Emir's knowledge, and on his sole responsibility; and, when Bender was informed of what had happened, he sent for Mohammed, and expostulated with him on his presumption. Then, in the dispute which arose between them, Mohammed suddenly drew his dagger and stabbed his nephew, and, with his friends, seized the palace. Lastly, in order to strike terror into all his opponents, he ordered the heads of sixteen of the princely family of Hail to be cut off. This violent action had the effect intended, and ever since he has reigned unquestioned.

Apart from its criminal commencement, Mohammed's government has been mild and just. Like all the Ibn Rashids, he is possessed of very considerable political instinct, and has succeeded in making his subjects half forget, and quite forgive, his crimes. He has had the good sense to make peace with his neighbours—even such hereditary enemies as the Roala and the Sebaa. He is on terms of alliance with all the Bedouins south of the Nefud; and every year brings him in fresh tributaries from among the former dependents of Ibn Saoud. Taxation in Jebel Shammar is light, service in the army voluntary, and Ibn Rashid's government eminently popular. Nowhere in Asia can be found a more prosperous, contented, and peaceable community than in Jebel Shammar.

Ibn Rashid pays a small tribute annually to the Sherif of Medina, as an acknowledgment of the Sultan's suzerainty, a political fiction which Mohammed finds it useful to encourage. It saves him the trouble of protecting such outlying possessions as Teyma and Jof from Turkish aggressions, while in reality the Sultan has as little authority in Nejd as the Queen of England or the Czar of Russia. Another important reason with Ibn Rashid for keeping on terms with Constantinople is his present monopoly of the Persian *haj* arrangements. The old route through Riad has been abandoned for many years; and Ibn Rashid now contracts with the pilgrims for escort and conveyance along the whole route from Meshhed Ali to Medina. This brings him in, at the lowest computation, 20,000*l.* yearly, besides enriching the tradespeople of Hail.

The date of our arrival at Hail happened to coincide exactly with that of the Persian pilgrims on their return from Mecca; and, at the Emir's suggestion, we took advantage of the circumstance to make our own return journey northwards in their company. We accordingly joined the pilgrim caravan, and on the 1st of February left Hail.

The Persian pilgrimage last year consisted of upwards of two thousand persons, with whom were associated some hundred natives of Bagdad and Bussora, the whole escorted by perhaps a thousand Bedouins, some of them armed, but most of them mere camel-drivers. The escort proper was composed entirely of Shammar, but the owners of camels were indifferently Shammar, Sherarat, and Daffiri. The Emir el Haj, a negro slave of Ibn Rashid's, headed the procession with a body-guard of twenty men mounted on thoroughbred dromedaries handsomely caparisoned and carrying with them Ibn Rashid's banner, green and purple. The richer pilgrims were also provided with handsome dromedaries, for which they paid a handsome price. All money negotiations are conducted for these pilgrims by *hemeldaria* or contractors, natives generally of Meshhed Ali, who for a certain sum agree to provide everything. The trade of *hemeldaria* is a very speculative one, large fortunes being often made by it, and sometimes lost. On the *hemeldaria* fall all the casual losses by the road, which he is bound to make good at any cost; and when, as happened on our journey, a great mortality occurs among the camels, the contractors are ruined.

Although we lived principally with the Bedouins and the Arabs from Bagdad, we made several acquaintances among the better class of Persian pilgrims, and paid and received visits in camp most evenings. The mendicant dervishes too were constantly in our tents, as we gave them food, and sometimes money. With all these we were on excellent terms, though, from our ignorance of Persian, we were unable to converse freely. Among them were some poor women who had travelled on foot the whole way to Mecca, and were still walking. A few of the pilgrims, and especially some Afghans, showed their religious dislike by refusing to answer our salutations, or to eat with us. Once or twice, too (we were told by the Arabs), sermons were preached by the Persian mollahs forbidding pilgrims to hold intercourse with us. We had nothing to fear from such animosity, for we were still the guests of Ibn Rashid, and we often amused ourselves by galloping about among them, and frightening them with pretended ghazus. We camped, however, always at a little distance from them, and sometimes left them altogether.

With all the pilgrims of Arab birth we were in excellent relations, even with a certain Saleh ibn Benji, guardian of the great mosque at Medina, who was on his way to Persia to collect offerings for the shrine. From him we learnt many particulars about the sacred city. He told us that in Medina and Mecca there is no dislike to Europeans as such, but that it is necessary they should conform there to the practices of Islam. I take it there would be no kind of difficulty in visiting either of these towns under a Mussulman garb, even if that garb were known to be merely nominal. If, however, a Christian or a Jew should go there openly as such, he would certainly lose his life, as the scandal would be public. Pilgrims from India, Saleh assured us, were always well received, but the Persians were liable to ill-usage as heretics.

The progress of the pilgrims was very irregular, the day's march being sometimes only a few miles, sometimes as much as thirty or even forty miles. Now and then a halt was made for a couple of nights, and once there was a forced march of a hundred and sixty miles in six days. The cause of this was, at first, a difficulty about procuring camels for all the pilgrims, who were more numerous than had been expected, and later the rapacity of Ambar, the negro Emir el Haj, who endeavoured by wearying the pilgrims to get money from them. More than once the hat was sent round, and a poll-tax of four shillings was exacted. From this annoyance we, as guests, were excepted.

From Hail there is at first no regular track. The route lies by Bekaa—or, as it is now called, Taibet-ism ("happy be its name")—and thence to the wells of Shaibeh, which stand on the old Haj road, which passes east of Hail to Bereydah. Taibet-ism is a considerable oasis with a subbkha and large straggling gardens. It must have a considerable population, and is the last inhabited place on the road, if we except Kasr Torba, a castle 45 miles to the north-east, which is garrisoned by Ibn Rashid's troops. This lies in the Nefud, 14 miles west of the pilgrims' road. It is of modern date.

We left the haj at Taibet-ism, tired with the slow rate of travelling, and, passing Kasr Torba, pushed on in search of some Shammar tents we had heard of in the neighbourhood. The Nefud at this point is intermittent, and presents little difficulty in crossing it. It abounds in hares and bustards, and we enjoyed some hawking and coursing. We travelled in company with a young man and his mother who were looking for their tribe. Failing in our search, we rejoined the Haj road in the neighbourhood of the first of the reservoirs of Zobeyde, which are of concrete, and for the most part in good repair. Owing to a local fall of rain these were full. The tanks and wells and caravanserais on the Haj route were built by Zobeyde, the wife of

Haroun el Rashid, in the eighth century, after a pilgrimage in which she had suffered much from want of water. The wells are very deep, and are wider at the mouth than those usually found in the desert. The caravanserais, built of stone, are all now in ruins. In some places the road has been cleared of stones for many miles together, and the heaps on either side give it the appearance of having been walled. It is generally asserted by pilgrims that the stones once supported posts from which an awning was stretched to give shade by the way; but this I believe to be a fable.

While we were travelling in this way alone a curious adventure happened to us. We had encamped one evening in a hollow not far from one of the reservoirs, when we saw five Bedouins coming towards us on their dromedaries. They alighted beside us, and when we had served them coffee, as the custom is for the first arrived to do for a later comer, they informed us that they belonged to the Ketterin tribe, a branch of the Beni Khaled, itself a branch of the Beni Laam, and that they had been sent by their sheykh on business to Hail. He had heard, they said, of the arrival of a kinsman of his own at Ibn Rashid's court, and they were to invite him to their sheykh's tent. We asked his name, and, to our surprise, were answered "Muttlakh ibn Aruk." Here, then, were the descendants of that third brother referred to in the Ibn Aruk legend, and to find whom we had originally travelled to Nejd with Mohammed. The next day the men turned back with us, and took us to the Ketterin camp.

These Ketterin, though a small and poor tribe, boast very honourable descent, and have preserved the ancient Arabian morals and customs untainted by any mixture with town life. They received us with all honour, and, I am pleased to think, with all affection as the friends of their sheykh's cousin. We found them in a very deplorable condition. There was no grass in the desert, and their camels were not yet in milk, so that they were reduced to live entirely on dates and locusts—indeed, mainly on the latter. Their mares too (and they had some good ones) were principally maintained in this way. It is, I think, not generally known how excellent locusts are as food; we had already, since leaving Hail, made them a chief article of consumption. They were abundant that year everywhere, and were, in truth, a godsend to the tribes. The red locust, which is, I believe, the female, is the best eating, and should be plain boiled. No further preparation is necessary beyond pulling off the long legs; then the insect is taken by the wings, his head dipped in salt, and he is eaten just as he is. In taste he resembles green wheat, having a very delicate vegetable flavour. Fried he is less good. It is, however, fried, or rather, dried over the fire that locusts are given as food to cattle. Horses thrive on them, and nearly every animal in the desert devours them. Our dogs caught and ate them greedily, and the camels will occasionally munch them in with their pasture. Buzzards follow their line of flight, bustards, desert larks, hawks, and even the smallest birds pursue them, while a hyæna I shot was found to be full of them. Locusts should be gathered in the morning while the dew is still on their wings, as later they are difficult to secure. I recommend these facts to Biblical commentators, who have been driven to strange shifts in accounting for St. John the Baptist's diet.

By these worthy Ketterin I was made their honorary sheykh, and they have promised me that next year they will migrate northwards to the neighbourhood of Palmyra, where Mohammed will be able to introduce them to the Anazeh sheykhs. As an earnest of this, Muttlakh accompanied us into Meshhed Ali, where we arrived with the pilgrims after a forced march, and with the loss for them of five hundred camels, on the 1st of March. Thence we went on to Bagdad and to Persia, but this is beyond the scope of my present paper.

And now before concluding, I will sum up the scientific results, if any, of my journey to Nejd.

In the first place, I trust that it may have served to fill up a gap which has hitherto existed in our knowledge of Northern Arabia, the line between Damascus and Jof. The oases of Kaf and Ittery have not, I believe, been previously visited by Europeans, nor has the Wady Sirhan been explored. By taking barometrical observations throughout its entire length, I have now ascertained that the Wady Sirhan from Ezrak to Jof lies on a nearly uniform level of 1850 feet above the sea, or about 500 feet lower than the general level of the plain of the Hamad. This seems to prove that the term wady, or valley, is misapplied, and that it is, in fact, the bed of an ancient inland sea, just such another as is the Dead Sea. Jof and Meskakeh lie at exactly the same level as Kaf and Ittery. With regard to the plain of the Hamad, I have ascertained that there is a general upward slope of 10 feet to the mile from the Sea of Nejef to Jebel Shammar. The slope is not unbroken, but consists of a series of shelves terminating in abrupt edges one above the other, the edges facing the line of descent.

Along the whole of this distance I have roughly surveyed the pilgrim road, and marked the position of the various wells and reservoirs made by Zobeyde. I trust that the map which I have made of our route may be of use to future travellers.

With regard to the district of Jebel Shammar, I have also made a map which, if not absolutely accurate, will still be in general accordance with facts (more than can be said for any now existing). It is singular that Hail should hitherto have been marked by geographers as being south of the Jebel Aja, whereas in fact its position is due east of it. Hail, I may here remark, is pronounced distinctly Háïl, without any sound of a *y*. I have, I hope, done something also towards ascertaining the general height of the Nejd Plateau, which is considerably greater than has hitherto been supposed. The level of the plain is 4000 feet, and that of the mountains can be little less than 6000 feet above the sea.

Lastly, and this is, I believe, the most interesting result of my journey, I have collected a series of facts relating to the physical condition of the great sand desert of Nefud—facts which seem to have escaped all previous observers.

It is seldom, if ever, that a traveller has crossed this district at his leisure and in reliable company; and in my case I had the additional advantage of doing so in perfectly clear, still weather, when every feature of the scene was observable for miles around me. I am therefore confident that in what I am about to say, even where it contradicts the accepted opinion, I have not been mistaken.

Mr. Palgrave has unaccountably described the Nefud between Jof and Hail, as a series of symmetrical undulations running north and south with wide intervening valleys, the whole a mass of shifting sand and destitute of vegetation. He attributes the regularity of this phenomenon to the rotatory movement of the earth, and holds it as distinct from the effect of any prevailing winds noticeable elsewhere. Into this ingenious argument I do not propose to enter, for the reason that I have been entirely unable to discover the existence of the phenomenon it refers to. I can, on the contrary, state most positively that no "symmetrical undulations parallel with the axis of the earth" are observable in the Nefud. Certain low ridges exist, but they are far from regular, and never continue for more than half a mile, nor are they by any means a main feature of the Nefud. In the central portions of the district they disappear altogether. What is, however, at least as strange a phenomenon, and one which equally needs ingenious argument to explain, are the deep horse-shoe hollows with which the whole surface of the plain is pitted. These are indeed its main, almost its only feature, and I will endeavour to describe them. They are called by the Arabs *fulj*, and are evidently permanent in site and conformation, as is evidenced by the shrubs and bushes which line their sides, and by the tracks which cross and recross each other in those of them which are frequented by sheep. The testimony of the Bedouins, also, is universal on this point, and the guide with whom I travelled assured me positively that for the forty years during which he had constantly passed that way, the fuljes had remained unchanged. The singularity of their condition is that they are absolutely uniform in shape, differing only in size, and that they are all set with great regularity towards the same point of the compass. Between Jof and Hail it is necessary to pass along the brinks of many hundreds of these, and in other parts of the Nefud I have again observed them wherever a sufficient depth of sand occurred.

In shape these fuljes exactly reproduce the print of an unshod horse's hoof, the toe pointing westwards, and marked by a steep declivity, while the bottom of the hollow slopes gradually upwards to the heel until it reaches the general level of the plain. The frog of the hoof is roughly represented by a number of shallow water-courses converging to the lowest point, the toe. In the deepest of these fuljes solid ground sometimes occurs, and enables one to form a fair guess at the general thickness of the superincumbent sand. I have measured a great many fuljes with the barometer, and found them as deep as 220 feet; many of them, however, are not more than 20, 50, or 100 feet in depth. They vary proportionately in width, the widest being perhaps a quarter of a mile across, and the smallest 50 yards. At the western edge of the deepest fuljes a sand mound generally occurs which may add another 50 feet or so to the apparent depth of the hole. The mound is usually bare of bushes, and is affected by the wind which shapes it into ridges such as are commonly found in sand or snow. It is difficult, however, to understand how these can have been described as "gigantic symmetrical undulations." If undulation there is of any sort, it is certainly not from north to south, but rather from east to west. The fuljes, as I could see very plainly from the summit of the rocks of Aalem, follow certain lines far indeed from symmetrical, yet still distinctly traceable. They run in long sinuous strings with a main direction generally corresponding with their aspect; this gives them still more the appearance of huge horse-tracks, and it is possible that the interval between them might be called ridges, but these would run east and west.

What may be the cause of this very singular phenomenon, I will not affect to determine. At first sight I was inclined to fancy that it was due to the action of water, and that each long string of hollows corresponded with an underlying wady, but this can hardly be the case. The aspect of the fulj is too regular to be dependent on any uniformity of surface in the plain below; it is inconceivable that a slope of solid ground should be so regular over so vast a space as to admit of no exception. Moreover in one instance, where the rocks of Ghota, opposite Jubbeh, crop out of the Nefud, I note a fulj actually intersected by solid ground, yet preserving undistorted its general outline.

On the other hand, it is equally difficult to seek in the prevailing winds a solution of the mystery. The red sand of which the Nefud is composed, is coarser than the yellow sand generally found in the desert, and less subject to the caprices of the air. As a matter of fact, the fuljes do not vary with variations of the wind, however violent. If not absolutely permanent in site and shape, they are at least sufficiently so to make their transformations imperceptible to those who know them even after a lapse of years. For my own part I believe very little in the obliterating effects of wind—the bones of camels and men who died in these fuljes ten or twelve years ago, were still pointed out to me *in situ*, the sand had not covered them; sticks, stones, the dung dropped by camels, remain where they fall. An ancient road, said to have been made by Abu Zeyd when that hero left the Nejd to conquer Tunis, may still be traced at intervals between Jubbeh and Igneh, unobliterated in spite of every wind; and it is by landmarks such as these that the Bedouins feel their way from Aalem to Shagik. The cause of the fuljes can hardly be the wind. I trust, however, that some one present at this meeting may be able to throw more light upon the subject than I have been able hitherto to obtain.

Another error which I would correct in connection with the Nefud is its reputation for sterility. Desert for desert, there is none more luxuriant than this district of red sand. Its vegetation is its own, and as I have brought home specimens, I hope before long to be able to publish a classified account. Suffice it now to say that not only the hollows are well clothed with shrubs, but nearly every part of the plain. Three separate grasses are found, and two considerable bushes, almost worthy to be ranked as trees. During the whole of our journey we never were so comfortably off for pasture and fuel as in the Nefud. The *ghatha*, which often grows to a height of 12 or 15 feet, gives a bright, smokeless flame, and makes the purest charcoal in the world. It is a singular fact that this bush, though extremely plentiful in the northern half of the Nefud, suddenly disappears south of Aalem—its place being taken by a bush called *yerta*, which has the rough, tangled appearance of a vine. After a rainy winter, I have little doubt that the whole of the Nefud is covered with grass and flowers. Indeed, the Nefud explains to me the existence of horses and sheep in Nejd, which would otherwise be impossible. For the table-land of Jebel Shammar and the mountains themselves are almost devoid of pasture. The Nefud is the summer home of all the Bedouin tribes. As soon as the camels are in milk, the Bedouins become independent of water, and wander many miles within its limits, always finding pasture. The Nejd sheep are said to be able to go a month at a time without water.

Of the wild animals found in the Nefud, the ostrich is the most valuable and perhaps the most rare; I had not the luck to see one. I came across the tracks, however, and afterwards saw a specimen of the wild cow or white antelope of the Nefud. The tracks of this animal were at least 100 miles from any place where it could have procured water, and the fact confirms what is related of it, that it never drinks. Gazelles do not penetrate far into the Nefud, though with wolves, foxes, and hyænas, they are numerous on its southern edge, having, no doubt, their homes in Jebel Aja, where water is found in the clefts of the granite rocks. Hares are plentiful everywhere. The ibex is found in Jebel Aja, and the leopard, and an animal known to the Arabs as the *webber*, which I have ascertained to be the marmot.

Of reptiles, the Nefud boasts, I believe, the horned viper and the cobra, besides the harmless grey snake called *Suliman*, which is very common everywhere. There are also immense numbers of lizards.

Birds are less numerous, but I noticed the frilled bustard, *Houbara*, and one or two hawks and buzzards. The Shammar Bedouins keep goshawks, which they train to take hares and bustards. In the Nefud I saw several small birds, especially a kind of wren, and the *Saxicola monacha*.

Of insects I noticed the dragon-fly, several beetles, ants, and the common house-fly. I was also interested at finding, sunning itself on the rocks of Aalem, a specimen of the painted lady butterfly, renowned for its long flights. This insect could not have been bred at any nearer point than the hills of Syria, 400 miles off. Fleas do not exist in Nejd, and our dogs became free of them as soon as we reached Hail.

Lastly, I will mention that I made full inquiries respecting sand-storms and storms of poisonous wind. The former, I was told, were common enough, but not dangerous to travellers, while, of the latter, the simoom was not even known by name. Rathi, my guide, denied positively that such a phenomenon had occurred within his forty years' experience.

One word about the term Nejd, which various writers have defined in various ways. The Turks, in their official documents, include, for political reasons, all the former territories of the Wahhabi empire in that name, giving to their new conquest on the seaboard of El Hasa the pompous title of "our Vilayet of Nejd." This has deceived even the English Foreign Office into the belief that Central Arabia is really a Turkish province. Dr. Wallin, though rejecting the sea-coast districts, includes all those parts of Arabia where the ghatha grows; but this is a little fanciful, for the ghatha grows as far north as Kaf, in the Wady Sirhan, and this certainly is not Nejd.

Mr. Palgrave, on the other hand, has, with still less reason, restricted the term to the single province of Aared, or the actual dominions of Ibn Saoud. This would be about as near the truth as allowing the former Papal States only to be Italy. The fact is, Nejd is a purely geographical expression, in no sense political, and, as commonly accepted in Arabia, means all that high-lying district included within the Nefuds. It may roughly be divided into three provinces—Jebel Shammar to the north, Kasim in the centre, and Aared in the south. A traveller who, at Hail, should ask his way to Nejd, would be somewhat in the position of a person who, at Milan, should ask his way to Italy. Ibn Saoud's present dominions are known at Hail simply as Aared.

On the conclusion of the paper :—

The PRESIDENT said he was sure everyone present must have been greatly interested in the modest account that Mr. Blunt had given of his travels, which so far as he could judge had added considerably to our information regarding Central Arabia. In the first paragraph of his amusing book, Mr. Palgrave said, "Let us try to obtain a comprehensive and thorough knowledge of the centre of Arabia." And certainly that country appeared to be one of the most romantic in the world, in regard to its historical interest, the nature of its inhabitants, and its physical aspects. Everyone who had passed through the Red Sea must have felt a desire to know something more of those blue mountains that were seen in the distance. The account which Lady Anne Blunt had published of the travels of herself and her husband in Assyria, had added another most interesting book of travels to the literature regarding that country. It was a great privilege to have that lady present that evening, and he was sure that the Fellows would enjoy the treat which she had provided for them in the beautiful drawings which had been placed on the table. From Mr. Blunt's account of the reception he had met with, the inhabitants of Central Arabia were apparently now prepared to receive English travellers with a cordiality which they had not always shown.

Sir **Lewis Pelly** said he thought the Nejd which Mr. Blunt had visited, with the result of adding considerably to our geographical knowledge, lay a little to the northward of that Nejd which was visited by Palgrave and himself in the year 1864–65. Mr. Blunt had evidently been on the route of the pilgrims from Mecca to Bagdad; but, in fact, the word "Nejd" meant high land, and therefore any high land in that portion of the world would probably be called Nejd. But Nejd had also a political signification, and during the eleven years that he had had relations with its ruler, the political Nejd was limited to the territories of the Emir of the Wahhabi, who was always called the Emir El Nejd. In a religious point of view he would be called the Imaum of the Wahhabi, but in his own country he would be called the Sheykh *par excellence*. That Nejd lay around the old Wahhabi capital of Dereyah and the new capital of Riad. Approaching it from the Persian Gulf the traveller would pass over a certain flat desert district, then arrive at a rise in the country, and again pass over a wide expanse which was known as the Sumaan district, until he came to the Nefud. Nefud was a series of huge sand ranges trending curvilinearly in a north-west and south-east direction. It stretched, roughly speaking, right down parallel with the Arab littoral of the Persian Gulf, and northward to Jebel Shammar. So far as he observed, it consisted of about seven huge sand ranges of hills varying in height from about 20 to 85 feet. He considered that the configuration of the sand was largely determined by the electric condition of the atmosphere, and that its general trend was due to the prevalence of the north-west wind. Between the ridges there was usually a large space about six or seven miles in width which was sometimes thoroughly hard and level. Having crossed the Nefud the traveller came upon another plain called Ormah, and then began to rise into the Nejd proper at the district known as Sedair. From thence he would get to Seddus and so into the Wady Hanifah, close to the ancient capital of Dereyah. He would read to the Meeting an extract referring to this subject from the paper he communicated to the Society in 1865:*—"Geographically considered, Nejd, as the term implies, means *the highlands* in the heart of Arabia. So considered, it would include the Towaij hills and the Aridh on its eastern frontier, Kharj and Howteh on its southern, Arh, Washm, and Kassim on its western frontier, and Jubbul Shummur on its northern. Politically considered, the present frontiers of Nejd coincide with the existing frontiers of the Wahabee Amir, and are as follows:—

"On the west, a line drawn nearly north and south between Hejaz on the one side, and the Wadi Dowasser and Hazm-ar-Rajee hills on the other. Wadi Dowasser is on the southern extremity of this frontier, and Jowf-al-Amar on its northern extremity. On the south, Nejd is bounded by the Rob-al-Khali, or Great Desert, from the Wadi Dowasser, on its western extremity, to an undefined point in the desert towards the Persian Gulf. On the east, the Nejd frontier comes down to the Persian Gulf from Kowait, on the northern extremity of this line down to

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* 'Journal R. G. S.,' vol. xxxv. p. 186.

Abuthabi. Passing Abuthabi, the frontier line keeps a little inland, behind the *quasi* independent maritime Arab settlements, on its pirate coast, until it reaches Bremy, where the frontier line turns south-east, and runs behind the hills of the Muskat dominions of Oman. On the north, the frontier line of Nejd stretches from Jowf-al-Amar, above-named, to the immediate neighbourhood of Kowait, on its eastern extremity."

To have passed that political Nejd, it would have been necessary on arriving at Hail instead of passing north-east towards Bagdad, to have proceeded southward through the Wahhabi territories, whence a debouchment might have been made at Katif or at Kowait, on the Persian Gulf. In the account of his own journey which he gave to the Society in 1865, he mentioned that he was then about to report, as was his duty, to the Government of India on the subject. He subsequently did report fully, but he had recently found that no copy had been supplied to the library of the Society. He wished to state, on this the first occasion of having an opportunity of addressing the Society, his deep and lasting feelings of gratitude and thanks to their former President, Sir Bartle Frere, for the invariable and most invaluable support and encouragement which he always received from him during his eleven years' experience in Central Arabia and on the Arab littoral, the shores of the Persian Gulf, and many other places.

Mr. Blanford thought there was no doubt that the great sandy areas, a large number of which existed on the edges of the Tropics, were deposited by the wind. A few years ago he had occasion to examine the large tract in India, lying between Sind and Rajputana, which was marked on the maps as The Great Indian Desert. Like the tract traversed by Mr. Blunt, it was composed entirely of sand, and he found that there were several phenomena connected with the deposition of the sand which it was very difficult to explain, and which appeared to him not to have been investigated before. In that case also he found a number of depressions, very different, however, from those described by Mr. Blunt. They formed a series of troughs parallel with the direction of the wind; and he was unable to explain them at all satisfactorily, but was inclined to attribute them to denudation by the wind itself. The action of the deposition of sand was pretty well understood. The sand travelled forward in a series of wave-like ridges similar to those produced on a small scale on the sea-shore by the wind, or by a current of water. They might be seen abundantly on any sandy shore, and by observing them carefully it would be noticed that one side was always steeper than the other, the steeper side being to leeward, or in the direction in which the current flowed. This was due to the fact that the sand was driven by the wind slowly up a gradual slope and then dropped over on the other side. There were of course two possible ways of accounting for the very curious fuljes or depressions noticed by Mr. Blunt. They might either have been produced by local subsidence, or by small areas not having been filled up when the ground around was covered to a greater or less depth by the sand. A third possible mode of origin, denudation, was inconsistent with the form of the depressions. That they were not due to local subsidence was, he thought, proved by the fact, mentioned by Mr. Blunt, that the underlying stratum was exposed at the bottom of some of them. If they had been caused by local subsidence the sand would have dropped in from all sides. They must therefore be regarded as places which had not been filled up when the general area of the tract was raised. He noticed in the drawings on the table that one side was very much steeper than the other, and Mr. Blunt had mentioned that they all pointed in one direction. He thought it was probable, though he would not speak with any certainty, that these depressions were scattered along the advancing edge of a mass of sand which had been at some former time driven over the country by the wind, and which possibly was to a small extent still being driven, the steep margin of the depression indicating the side from which the sand advanced. In Rajputana it was well known that masses of sand occasionally swept over the country, and then after many years were carried further on, leaving the land just as it was before the covering took place. At the same time, in the Indian Desert, and doubtless in the Arabian Desert, deposits of sand remained unaltered for a very long period of time, so long that vegetation of many years' growth could be seen upon them. Wherever sand-hills were advancing, the advancing surface was in a series of curves. If a similar hill of small size was being formed, it appeared to him that the tendency of the hill generally was to form itself with its longest diameter at right angles to the direction of the prevailing winds, and the extremities tended to advance more rapidly than the central higher portion, so that the whole formed a crescent shape. If one of those hills impinged upon another, there might remain between them some such depression as Mr. Blunt had described. It appeared to him in the drawing of a *fulj* that there was a very great resemblance to the leeward slope of masses of sand such as he had seen elsewhere; and he thought the reason he had given might possibly be the correct one, though it was not perfectly satisfactory, because it did not explain why so very large a number of these depressions should occur nearly or exactly of the same form. The only other matter about which he would attempt to offer any remark was the white antelope mentioned by Mr. Blunt. He thought that animal must be the Beatrix antelope, which belonged to the genus *Oryx*, as did also the gemsbock of the Cape of Good Hope. All the species known were African except this one which was found in Arabia; but, so far as he was aware, the latter had not before been found so far to the northward as the district which Mr. Blunt had visited. One or two specimens of this antelope had been brought to England and exhibited in the Gardens of the Zoological Society, but those were obtained, he thought, from the neighbourhood of Mekran, the animal being found on the northern slope of the hills of Oman.

Sir **Henry Rawlinson** said, Arabia was a country in which he had always taken great interest; and all Eastern travellers must have shared the same feeling. There was a sort of weird mystery about it, from the difficulty of penetrating into it and the character of its inhabitants. Jebel Shammar, especially during the twelve years he was at Bagdad, always exercised a particular influence on his imagination. There was at that time great difficulty in reaching the country. The medical man attached to the Residency in those days, Mr. John Ross, a great traveller and a perfect Arabic scholar, had been over the whole of the Mesopotamian Desert, and had penetrated into many of the nooks and corners of Arabia; but he was never able to reach the Jebel Shammar. That district was peopled originally by a branch of the great tribe of Shammar, who were the rulers of the whole Mesopotamian Desert. He was not aware if his old friend, Sfuk, was still living.

Mr. **Blunt**: He is dead.

Sir H. **Rawlinson** said that, in his time, Sfuk was the great sheykh of the Shammar, and always acknowledged the Shammar of Jebel Shammar as kinsmen of his tribe. But notwithstanding the difficulty of reaching the interior of Arabia, there had been during the present century a succession of travellers, who had increased our geographical knowledge of the country. The first person, he believed, who crossed from the Persian Gulf to the Red Sea was Captain Sadleir, who was passed across like a bale of goods. Every sheykh had to give a receipt for him, and send him on to the next tribe, and he was delivered safely at Jeddah at the end of his journey. That was not a very scientific exploration; but for many years he was the only Englishman who had ever been to Dereyah, the Arab capital. Some twenty years after, when the Egyptians invaded Arabia, a good number of foreigners, Frenchmen and Germans, accompanied the troops, and obtained a tolerable knowledge of the centre of the country. But Dr. Wallin, a half-naturalised Englishman, was the first person who really gave any detailed account in English of the interior of Arabia. He was a Finnish professor. He went into Arabia as an Arab, and lived at Mecca and Medina for many years. When he came out again on the Persian side, he was so completely an Arab that Captain Jones, the commander of the steamer, kicked him out of the ship as a dirty Arab who had no business there without permission, and was utterly astonished when he was asked, in very good English, whether he would not be kind enough to give him a passage from Bussorah to Bagdad. He then made inquiries, and found that the supposed Arab was a cultivated, highly accomplished European professor. He (Sir H. Rawlinson) afterwards took Dr. Wallin on a visit to Sheykh Wadi, the sheykh of the Sobad, and introduced him as an Osmanli professor, who had lived in Medina, where he studied Arabic literature. They got into conversation, and all the Bagdad ulema present were astounded at the profundity of the learning of the Osmanli. After he had drawn them out for half an hour or so, he quietly walked over to the English party and began talking English. The astonishment of the Arabs was something marvellous to look at. They could not believe their own eyes, that the man they had supposed to be a true Arab was in reality a mere Feringhi. It was a great misfortune that Dr. Wallin died in his early manhood. He promised to be a most admirable, efficient, and valuable Oriental traveller. He had been heard at a meeting of the Royal Geographical Society, and received, in 1850, an honorary reward from the Council for his travels in Arabia. The next person was Mr. Palgrave, who, on his return from his Arabian tour, gave the Society, at their old quarters at Burlington House, an account of his journeys, which, no doubt some of the members present recollected, was received with enthusiasm. He was certainly a most entertaining lecturer, with a great command of language, and was full of his subject. After Mr. Palgrave, Colonel Pelly made a very remarkable journey to Riad, of which he published an account in the 'Journal'; and now Mr. Blunt had shown himself a worthy successor of former travellers. His journey was mostly over new ground. It was only from Jof to Hail that he was actually in the track of Mr. Palgrave. He reached Jof by a different route, and the route from Hail to Meshhed had never before been followed by a European, because Dr. Wallin went direct from Hail to Bussorah. Sir Lewis Pelly was quite right in what he had said about Nejd. Nejd was a name belonging to physical geography, simply meaning a highland, and in all historical geography was applied to the great plateau of Central Arabia, which was elevated, and surrounded on all sides by desert. Jof meant the low land, from an Arabic root signifying a hollow, and was constantly contrasted with the Nejd or the high land. When he was at Bagdad the Jebel Shammar was never considered to be really a part of Nejd, but was regarded as the bulwark or barrier of Nejd—the outer range which upheld the great plateau. The Turks had never really occupied the district of Nejd, but they exercised a very considerable influence there. The two great Wahhabi chiefs, who resided at Riad, acknowledged the authority of the Turkish pashas, and sent them tribute and presents to El Hasa, and to a certain extent they admitted themselves to be Turkish subjects; but it was well known that there was a national antagonism between the Turks and the Arabs, which would prevent anything like thorough amalgamation. It was a new fact in political geography, that now the Emir of Hail was really the head of the whole of the tribes of Nejd.

Mr. **Blunt**: That is not quite the case. He is perfectly independent of Riad, but he has no authority in the dominions of Riad.

Sir H. **Rawlinson** said at all events he appeared to be equally powerful with the Emir at Riad. These Arab sheykhships fluctuated according to the personal character of the ruler, the development of the resources of the tribes, or the pressure brought to bear upon them, especially by the Turks, and Hail might now be considered the political successor of the old Wahhabi Emirs. He was rather surprised to find that the horses at Hail were only 13 hands 2 inches. The Nejd horses, or what were considered such, bought at Bagdad and sent to Bombay were certainly higher, from 14 hands 2 inches to 15 hands. According to his experience a Nejd horse only 13 hands 2 inches was certainly a rare thing.

Mr. BLUNT said there was only one horse at Hail 14 hands 2 inches, and she was bred in Mesopotamia.

Sir H. RAWLINSON said the Anazeh horses that he had seen would not compare in strength with the Nejd horses. He appealed to Sir Arnold Kemball and others who were acquainted with the desert whether they did not always consider an Anazeh horse of much inferior blood to a real Nejd horse. Mr. Blunt had also said that horses were very rare in Nejd, camels being generally used, but from 1000 to 2000 horses from Central Arabia were annually exported from Bagdad, Bussorah, and Katif.

Mr. BLUNT: Ibn Rashid told me he sent eighty or ninety colts every year to India, but he is the only person in Jebel Shammar who has any horses at all.

Sir H. RAWLINSON said the dealers at Bagdad bought 200 or 300 horses at a time, and entered into contracts for them. He was sorry that Mr. Blunt did not fare better with the Persian pilgrims. They must have been suffering from bad weather, the heat, loss of camels, &c., which made them testy, but to suppose that Persians would not eat with Europeans was a mistake. They had not the slightest objection to living with Europeans like one of themselves. On their pilgrimage they might be a little sulky, but that was not their characteristic at all, and when off their pilgrimage they were the most agreeable, chatty, social companions to be met with. But notwithstanding these differences he had been very much interested in Mr. Blunt's paper. He congratulated him sincerely on his journey, and if Lady Anne would permit him he would congratulate her also. It was a most surprising thing for an English lady to mount horse at Palmyra and Damascus and ride through Arabia, passing through a district which the experienced doctor he had mentioned never could reach, and then turning back by the Caliph route. It was a most astonishing exploit, not merely satisfactory to herself but to the nation which possessed a lady of such a character. He hoped that Mr. Blunt and Lady Anne would allow him, as the spokesman of the Society, to thank them most sincerely for their very excellent paper, and he was commissioned by the President to beg that he might be permitted to propose a vote of thanks to them.

Lieut.-General Sir ARNOLD KEMBALL seconded the vote of thanks, after which a few remarks were made by Mr. CYRIL GRAHAM. The discussion then terminated.

Notes on the Route taken by the Royal Geographical Society's East African Expedition from Dar-es-Salaam to Uhehe; May 19th to August 29th, 1879. By JOSEPH THOMSON: in Command of the Expedition.

Map, p. 144.

IN the following paper I can hope to give but a very brief outline of the information collected and the route taken by the Society's Expedition.

It needs no words of mine to speak of the vast loss sustained by the Expedition by the death of Mr. Johnston, eminent as he was in the Geographical world; while I, thrown suddenly and unexpectedly into work with which I was totally unacquainted, cannot be expected to turn out, at the age of twenty-one, and in the heart of Africa, a very competent geographer. Being directed, however, by my instructions to continue the work in case any accident deprived the Expedition of Mr. Johnston, I am doing so to the best of my ability. Although my work may be rough, and the different places, rivers, &c., be not placed quite accurately, yet I hope my description of the main features of the countries passed through, with notices of the people, will not be without value. I am sorry to say that I have been unable to master the difficulties of the sextant and artificial horizon, and consequently I have been compelled to depend upon the compass. But in protracting my route, I have taken every care, and hope to be found not very far wrong when some more competent person, at a future date, shall visit the same country.

With these apologetic remarks I will proceed with my narrative.

Commencing with our departure from Zanzibar. On the 14th of May, towards evening, all the bales and the porters, to the number of 125, together with one woman, were shipped on board the *Star*, a steamer kindly lent to us by the Sultan for our passage to the mainland. Five donkeys belonging to the Expedition were also shipped on board a dhow for Dar-es-Salaam.

At 6 A.M. on the following morning, we bade farewell to Mrs. Kirk, to whose generous hospitality and assistance the Expedition was greatly indebted, and accompanied by Dr. Kirk we cleared out of Zanzibar Harbour with not a man missing, and with a fair wind we reached Dar-es-Salaam by midday. On the same day the men were landed and on the following all our goods. For two days Mr. Johnston suffered a severe attack of fever, but on the 18th he recovered. The 17th was occupied partitioning out the loads and the guns, mustering no less than seventy of the latter, twenty-two men carrying their own, though few of them were very effective weapons. The day following, a number of additional men were engaged, some to go to Behobeho, the others to Ubena, or further, if required, they bringing up our numbers to 150 men when all told. The afternoon of the 19th of May saw us fairly on our way, with the indispensable African accompaniments of shooting, blowing of horns, drumming, and shouting. The presence and assistance of Dr. Kirk was of the greatest value and gave an importance to the Expedition in the eyes of the porters, which it would not otherwise have had.

Passing round the end of the creek and marching along a sandy plain covered with tall grass and shrubs, we reached, after crossing a small stream, the neat Swahili village of Pongwe, where we formed our first camp under the spreading branches of a large tree.

The following day we crossed the narrow but deep Mzinga stream which flows into the creek, along which our route lay for three stages, having to cross it at least four times. So far, our route had been along the raised beach upon which Dar-es-Salaam is built, the creek resulting from its upheaval, having evidently been one of those deep but closed channels so common among coral reefs. We now made a considerable ascent, reaching what I believe to be the second raised beach of the East African coast-land, which I have already described as occurring at Pangani,* and camped at the village of Charambe, in Uzaramo.

The route the following day led us through a somewhat broken country, the hollows being occupied by marshes, through which we had to tramp the greater part of the way, camping at Tambani.

The following two marches, to Mzugu and Mkuranga, were through country in great part a sandy plain, thinly wooded, and cultivated only where some stream had cut a small valley, allowing the water to drain out from the sandy plain on the west. On the 24th we once more descended to the lower raised beach, which here occurs as a broad, level plain, in some parts marshy, but forming rich rice-fields. Near its centre is placed the large village of Liwela, where we found three villanous-looking Arabs, who had evidently fled from Zanzibar for some misdemeanour or other. On the 25th we rested, and, mustering the men, we found none as yet missing.

Recruited by our stay at Liwela, we once more commenced our march on the 26th. The previous night had been wet, and it was raining during our walk, which put the roads, or rather paths, into the state of drains. Through these we tramped till we reached the ridge upon which the large circular village of Kikonga is situated, overlooking the Liwela Plain, which is here seen to extend away towards the sea. A short march on the 27th brought us to Kidokwe, and on the following day, after a march through broken country, rising considerably, and crossing about three miles of marsh, we camped at the important village and district of Mkamba.

This village, inhabited by Wamrima, is situated in the midst of a series of well-cultivated ridges, with hamlets and villages everywhere peeping forth from a surrounding of coco-nut trees, mango, and jack-fruit. The chief of the place estimates his subjects at 6000, but this, I think, is an exaggeration.

On our arrival the guide was sent forward to find the best road for getting food on our way to Behobeho. He did not return for two days, and then reported that even by the best road food for eight days would require to be collected, as almost the entire way was through a country in which no food could be got, except at the village of Msangapwani where food was abundant.

To collect food, and men to carry it, detained us two more days at Mkamba, during which much rain fell. While this was in progress Mr. Johnston heard of a lake a short distance off where there were many hippopotami, and, having some time on his hands, started off to have some shooting; but on reaching the place, he found it to be a deep swamp, with floating vegetation, with a clear piece of water only in the centre. There was nothing to be seen but numerous tracks of the animals through the sedges; but hearing at last some grunting, he ventured in along one of the paths to the clear water, and waded till the water reached his armpits. Finding he could not reach far enough, he returned, and stood in his wet clothes by the side of the swamp while I was trying some other way of getting at the game. Nothing, however, was to be seen, and, amidst a drenching rain, we returned.

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* In "Notes on the Geology of Usambara," 'Proceedings,' vol. i. p. 559.—Ed.

Next morning Mr. Johnston complained of what he thought was rheumatism in the back, and dosed himself under that idea till more unmistakable symptoms showed him that the attack was dysentery. There can be little doubt that the shooting excursion gave rise to it, and probably if he had recognised the disease at first, it might have been got under; but several days passing before using the proper medicines, it became so much more difficult to remove.

June 2nd saw us once more tramping through jungle, marsh, and forest—a most wretched country, where the rain-water, unable to drain away, lies stagnant, and, in conjunction with decomposing vegetation, raises fetid, disease-laden odours under a tropical sun. Three stages through country of this nature, camping at the villages of Kifuru and Madodo, brought us to the village of Msangapwani, which we entered amidst a drenching rain. We found ourselves deceived by our guide as to the abundance of food at this place, and it was only after three days' hunting round the whole district that sufficient was collected to allow of a start. Our stay here did not improve Mr. Johnston's condition, and I myself had a sharp attack of fever, which lasted about a week.

For some days previously we had reason to suspect that our guide's knowledge of the road was somewhat deficient, and Mr. Johnston intended dismissing him. On the 21st, while at Msangapwani, he set our doubts at rest, and anticipated Mr. Johnston's intention. Receiving two dollars to buy food from a man who wanted to sell for money, he started off, and was no more seen.

Having at last got sufficient food together for our desert marches, we left Msangapwani on the 8th of June, although both of us were far from being in good travelling condition. Our walk proved to be a miserable one, along deep, miry pathways, through marshy grounds, and across two streams each more than waist deep, finally camping in the forest, both of us thoroughly exhausted. The next day Mr. Johnston could not move forward, and three days were spent before he was sufficiently recovered to allow himself to be carried in the sort of half-stretcher, half-hammock, which we constructed for him.

On the 12th we once more set forth, and, crossing a tract of forest, entered a jungle, the path through which was six inches deep under water, camping at last on a slightly rising ground, near sunset. Mr. Johnston became steadily worse from this day, the jerky, swinging motion of the porters, and the somewhat hard hammock, together with the intense heat, made him quite stiff and swollen, so that he could find rest in no position.

The following day brought us to the Khutu village of Keihimbwe, after crossing a stretch of forest and about three miles of swamp waist-deep, which drains into the Lufigi by a small stream, having entered the basin of that river.

Having reached the boundary of Uzaramo, along the line of our route, we may now take a retrospective view of the country we have passed through. With the exception of the villages of Pongwe, near Dar-es-Salaam, and the large district of Mkamba, which are both Waswahili, our route lay through Uzaramo, as far as Keihimbwe. The country itself may simply be described as a broad, level plain of sand, stretching from the Marui Hills to the sea, broken only by the undulating districts of Kikongwe and Mkamba, and by the small valleys cut here and there by insignificant rivulets.

During the dry season the country must be a burnt-up desert, owing to the good drainage which the red sand affords. But in the wet season the greater part must be submerged, as even in the lesser rains which we experienced, large tracts were still in that condition. A district of such character cannot contain an abundant population. The villages are small, and only found along the slopes of some small valley, or on a ridge like Kikonga, the country to the west being uninhabited.

The Wazaramo have already been described by other hands, and therefore little need be said by me. Along our route there was little to distinguish them from the Waswahili, except that they hardly looked so intelligent and were somewhat more sluggish in their movements. Their mud-built huts, square, with projecting eaves, forming a barasa in front, were after Swahili types, they dressed in the same manner, and they all seemed to understand and speak Swahili. The coco-nut, mango, and jackfruit are grown around the villages, as far as Keihimbwe, where as yet only young plants appear. Most, if not all, the vegetables of the coast are grown in abundance wherever the ground is fertile. The only articles of commerce are copal and rubber, the former being only found as far as Keihimbwe, and the latter not very abundantly, owing to the barren nature of the soil.

The vegetation is of the most monotonous nature, long tracts of small, stunted trees, unrelieved by flower or creeper, alternating with marsh or cultivated portions. Even such well-known African trees as baobabs, tree Euphorbias, mparmusi, and hyphene palms, were nowhere seen. From what has already been said about the nature of the country, it may well be understood that animal life cannot be very abundant, and such proves to be the case. From the lowest divisions of the animal kingdom to the highest, each is alike poorly represented. The only mammal seen was a squirrel, and birds were rarely seen, their existence being chiefly noted from hearing the hoarse caw of the hornbill, or the exasperating squeak of a small green paroquet.

Resuming our march we were struck at the absence of any change in the surface features of the ground in passing into the basin of the Lufigi. There appears to be no break between the raised beach along which we had been marching, and the ground into which we had now passed.

The village of Keihimbwe is large and well built in an oval form. The houses and people, from their proximity to the Wamrima and Wazaramo present few differences worth noting. A long, weary march from Keihimbwe brought us to the banks of the Lufigi, at which we arrived on the 15th of June, camping at the village of Kimkumbi. The river itself as seen from the village presents a most disappointing aspect, meandering through swamps and midst long sedges.

The following day the caravan being compelled to stop to collect additional food, I took the opportunity of crossing the river. I found the villagers had only two or three canoes, each able to carry not more than four persons with safety, being used in fishing and not at all in the way of commerce. Selecting one of the best looking, I crossed over to the other side, a work which took some time.

To judge by the eye, the river at Kimkumbi is half a mile broad, a considerable portion of which is taken up by a large sand island in the centre. Along the northern side the current is swift and the water deep, but far from uniformly so, as snags and mud-banks rise in the most unexpected places, even where the current is strongest and the water deepest. Along the southern side also the water flows swiftly, and is of considerable depth. The work of navigating the river at this point must be one of difficulty, as, owing to the muddy nature of the water, the mud-banks cannot be seen—indeed, our own canoe from this cause ran aground several times in crossing. It is said, however, that canoes capable of carrying twenty persons arrive with salt from Mpembeno during the wet season, and take down gum, copal, and rubber. I think, however, that the existence of canoes of that size is somewhat doubtful. Whatever may be said regarding its navigation by canoes, I think it is quite beyond doubt that no boat of dimensions large enough to do much trade on the Lufigi can ever reach so far as this village, and the people say that snags and mud islands occur as far as the confluence of the Uranga and the Ruaha. From Mpembeno the river would appear to take a great bend north, till reaching Kimkumbi it turns slightly south to the point where it divides.

Recommencing our march on the 17th, we followed the river for two miles. To the west of Kimkumbi, it is divided by a large island covered with long sedges.

The country through which our route lay is an arid stretch, uninhabited, and covered with stunted trees which were shrivelled up by the recent burning off of the grass. After a somewhat short march we camped at the village of Mtemere. This village is situated on the flood banks of the Lufigi, which is at this point about two miles distant, the intermediate space being occupied by swamps and lagoons, in which the villagers content themselves with paddling about after fish, and do not trouble themselves with the river, which I attempted to reach, but failed. This large space covered with water in the rainy season raises another difficulty in the navigation of the river.

The following three days' march carried us through an uninhabited tract of country, with not a spring or stream to water the ground.

The dreariness of these marches can hardly be conceived, still less described—the view circumscribed to a few hundred feet, not a sight or sound to attract the attention, nothing to divert us in our weary plod onward. The distant glimpse of a herd of antelope was quite sufficient to excite the whole caravan. Our camps in these stages were made near the banks of three small lakes, which seem to form a chain and probably mark out some old water-course. The porters felt these three marches most severely; the roads were cut up by the footprints of game during the wet season and had become hardened during the dry, making it most difficult for the men to walk. Then the trees were principally nasty thorny acacias, the thorns of which, shed on the ground, were constantly getting into the feet of the men.

On the 20th we emerged from the forest and entered a more undulating piece of ground with many pebbles of quartz. With the pleasant and novel view of hills in front of us, we then entered Behobeho, after passing through a small tract of tropical forest, and luxuriating in a drink of clear, crystal water, flowing over sand, the first stream of the kind we had yet seen.

Behobeho itself is a charming village, consisting of a winding line of houses of most varied and irregular architecture—impregnable with its forest-bound walls of tall trees bound together into an impenetrable mass by creepers of all sizes, the latter forming a tangle impossible to see through, in some places hanging snake-like, as if ready to strangle one, in others drooping from lofty mparmusi or graceful palm in light festoons. Outside flows a crystal stream through fertile fields, and beyond rise the picturesque hills.

During our stay at this place I took occasion to visit the hills. Crossing the stream and rounding a ridge which fronts the hills, we reached a small stream which flows to the Ruaha. During our walk my curiosity was aroused by the peculiar shape of the largest mountain. It consisted of a lower mass, quadrangular in form, upon which another of the same shape but of a smaller size, is placed; the sides rising quite perpendicularly and having a broad, level terrace round its base, giving it a remarkable likeness to some Cyclopean monument. Our further approach revealed a terraced appearance in the lower part.

On examination this peculiar shape was seen to arise from its geological structure, which was that of a series of lava beds intercalated between beds of fine chocolate-coloured sandstone in the lower part and greyish-red, coarse sandstone in the upper. The lava not being very decomposable, has resisted denuding influences longer than the sandstone, which has got worn away till a broad, flat terrace of about half a mile lies between the base of the upper part, which rises almost in sheer perpendicular precipices, and the edge of the lava sheet in the lower.

I attempted to ascend to the top, but became so sick that I had to descend. The name of the mountain is Mkulimahatambula, but I would suggest that for this uncouth name that of Mount Johnston be substituted. This mountain is the northern termination of a short range which extends south to the Ruaha, and from its geological formation and position I have little doubt that it was originally connected with the Marui Hills, and cut off from that range by the combined action of streams flowing to the Ruaha and Mgeta respectively. The sandstones are identical lithologically with those of Usambara, and doubtless belong with them to the lower part of the Carboniferous system.

With regard to the melancholy event which marked our stay at Behobeho, little more need be said. On the day after our arrival we constructed a hut into which we removed our leader, as being more convenient and comfortable than the tent, but the little we could do was of no avail; he gradually sank until the 28th when he finished his career, evidently not expecting that event, as he left no instructions and no messages.

The position I was thus thrown into was one of peculiar difficulty, and over the question whether I ought to return or go forward, I spent many anxious hours of thought. The conclusion arrived at, after carefully considering the pro's and con's of the question was that I ought to go forward.

Accordingly on the 2nd of July, we once more got in motion, though I was in a very unfit state for travelling, having caught a fever through running in and out of Mr. Johnston's hut during the night-time, and from the anxieties consequent on the position I was thrown into; however, so much time had been lost with one stoppage or another that I felt it necessary to push on. Crossing a dry, stony stretch of ground forming the water-parting between the Mgeta and the Ruaha, with low wooded hills on our left, we reached a pleasant stream, called Vilanzi, where we formed our camp, the stream flowing north-east to the Mgeta, which our guide, no less a personage than the headman of Behobeho, always called the Lufu. During our march we passed over some beds of fine grey shale dipping slightly W.S.W., then volcanic rocks with much quartz, and finally, at our camp, very hard chocolate-coloured sandstone with coarse grey sandstone and conglomerate, which were exposed in the bed of the stream.

Our route the following day led through a country still uninhabited, but clad with a richer vegetation than anything we had yet seen, though not much pleasanter to march through, being the half jungle, half forest, which Burton has so well described. On the road we were scared by some Wakhutu we met, who had each a different and more alarming tale to tell of "war," "roads shut up by the Wamahenge who were scattered throughout the country," "we should have to march during the night," &c., &c.

This seemed to mean a stoppage of our march in that direction, and where were we to get another? Knowing the character of African rumours I determined to push on to Mua where we were to camp and try to get some more definite information regarding this sudden appearance of the Wamahenge. Now and then, through the walls of vegetation which hemmed us in, the distant Duthumi Mountains were descried in the north-east, and to the south-west a low range of hills connected with Mkulimahatambula inhabited by the Wamahala, a race nearly exterminated for slave purposes by the Wakhutu and the Wamahenge. They live principally on fish and honey.

About midday we reached the town of Mua, situated like Behobeho in the centre of a dense mass of tropical vegetation, and reached through a narrow gateway and along a winding way. These masses of vegetation, growing frequently in a desert tract and linear in shape, deserve notice. The linear direction is generally in the line of drainage, so that probably it indicates some current of water under the soil. A peculiarity of Mua is that the houses are all of different shapes—conical, quadrangular, beehive, and composite of various forms. There could be no better place in which to study African architecture than Mua.

I found that the people had no definite information regarding the Wamahenge, and were the more afraid in consequence, not daring to move out of their gates. I was compelled to stay here a day to recruit, as my fever was getting worse, and it was only with the greatest exertion that I could move along.

Improved somewhat by my rest, I resolved next day to go on till I could get a proper understanding as to the position of affairs. The country on this stage was somewhat more open. While our party was marching in a somewhat straggling manner, I was aroused by seeing the porters all flocking back, some in hot haste, and shouting "Wamahenge! Wamahenge!" I at once supposed we had got into a fix, these warlike people being much dreaded by the whole country. Still I thought this was a good opportunity of making friends with them and securing a pass through their country; so selecting Chuma, a porter who could speak the language, and another, we proceeded to meet them. On coming upon them we were surprised by their strange "get-up." They were all naked, with the exception of a few who had some wild cat-skins placed indifferently on their backs and sides, and all had huge heaps of feathers on their heads, with a long tail of the same hanging down their backs. They also had various other arrangements, such as circlets of long hair, strips of skins, &c., all worn with the object of making themselves as fierce-looking as possible, and certainly they did look like typical savage warriors. Their arms consisted of a spear, two assegais, a club, and an oval or elliptically-shaped shield of bullock's hide which they carried over their heads.

On making our appearance they gathered round us with shouts. After we had obtained silence we proceeded to explain our peaceful intentions, and tell them where we were going. They on their part were as ready to explain that they were not fighting the white man or the Wakhutu, but the Walugulu who live on the Mkambaka Mountain; that they had been there and were now returning home with their chief's son who had become ill. They would welcome us when we reached M'henge. This was satisfactory, and relieved my mind considerably. We sealed our friendship by Chuma, on my part, drinking blood from the breast of the chief's son, who did the same from Chuma's; thereafter we fraternised on the best of terms.

The Walugulu are the Waruguru of Burton, whose country seems always to have been the hunting-ground of the slaver. They are nearly exterminated, but we found afterwards that the Wamahenge had failed this time in their vile object, the people having retired to places where they could not be followed.

After a short rest, to wait for the runaway porters and guides, we proceeded together to Mavigonga. The following day, burdened by some Wamahenge, left to go with us, and who proved a nuisance, we proceeded on our way down a valley, enclosed on the right by the Ulugulu Mountains, rising in high rugged peaks 3000 or 4000 feet, terminating to the south in a conical hill called Wigo, and on our left the Umahala Hills, having the hot spring called Magi ya wheta, which Burton has so elaborately described, though all I could get from my guide was "that it was a large spring, very hot, and always toot-toot-tooting."

Our next stage was a short one, owing to my weak state, terminating at the village of Padzi, which is situated in a forest like the others we had passed. On the 7th of July we reached Kilengwe, the Kirengwe of Burton. (It will be observed that Burton always uses the interchangeable letter *r* in preference to *l*, the latter being the one I invariably heard used, and which I employ accordingly.) I had now become reduced to such a state that I could not stand. On moving out of my tent to see if I was able to start with the men, I fell twice, so that it was quite evident I could not walk, and as I had to depend upon my compass bearings, I did not care to be carried. I was never in much pain, but so dazed and stupid that I could not think with correctness.

Greatly improved by three days' rest, though still very weak, I ordered the men again to shoulder their loads. An hour's march up the muddy bed of a stream was not a very encouraging start for a person in a fever, but it had to be done; so through the water we splashed. When at last we got out of it, I had to lie for an hour before we could once more march forward. The vegetation along this stream—the Msegwe—was charming, with creepers, palms, mparmusi, and other trees of varied tint and form growing in profusion. Up to this time we had not had the pleasure of walking over a piece of broken undulating ground. We now entered such. Basalt appeared at the surface in a very decomposed form, and the rains of the wet season had wrought havoc in the mouldering rock, cutting it up into deep, narrow glens, which had become covered with a pleasant flora, while on the tops of the ridges, owing to the too porous soil, everything green was shrivelled up, even to the trees, under the fierce sun. A porous surface stratum in Africa has always this result; if the surface is not damp and marshy, it becomes a desert.

After a long march through a country of sharp ridges and narrow glens, we reached the stream of Viladzi as the evening shades were falling, camping in a grove of bamboos. The night was very dark, and the scene around was of so peculiarly enchanting a nature that I could not resist leaving my tent, ill and tired as I was, to see it.

The march to the chief town of Khutu the following morning commenced, as in the preceding, with an hour's tramp up the waters of the Viladzi, which flows between high mud-banks covered with dense vegetation. It is only in such situations, or where water is present throughout the year, that the vegetation becomes luxuriant enough to deserve the name of tropical as popularly understood. At all other places there is nothing to be seen but stunted trees with stems three or four inches in diameter, and burnt-up grass.

Leaving the stream, we crossed a broken piece of country through a pass between a range of low hills on our left, and somewhat higher ones on our right, which formed a water-parting between the Kingani and the Ruaha, the Viladzi on the one hand, the Engomma on the other, representing each of these river-systems.

Before reaching the pass we found sandstone cropping out and dipping about 35° W.N.W. revealing the true nature of the basalt as intrusive, belonging to a lower place in the Carboniferous system than the lava beds of the Behobeho Hills, which are volcanic, and have not been disturbed by any intrusive action since their production. Leaving the pass with a high conical hill on our right, and crossing the Engomma stream, we reached Mgunda or Mbwiga, the chief town of Ukhutu.

Khutu or Ukhutu (both forms are used) consists of two tracts of country of very dissimilar nature. Between Keihimbwe and Behobeho nothing more barren could be conceived, not a stream or a hill to cross, stunted trees forming long tracts of miserable forest. Between Behobeho and Mgunda (the present name of the town, from the chief who is called Mgunda), we enter amongst hills and mountains with clear crystal streams and a fertile soil supporting a rich vegetation.

The Wakhutu must have considerably improved in condition since Burton's time. The two or three families living in miserable hovels have increased to large villages of two or three hundred houses, and they have emerged from their hiding-places amongst marshes and jungles to live in charming tracts of forest, where nature has exhausted her resources in producing everything that could make the place charming.

The Wakhutu are an exceedingly mixed race, the purest specimens are to be found about Mwigonga, Padzi, and Kilengwe, and a more degraded looking set could hardly be seen. They showed little curiosity when shown anything, but would look with a sort of idiotic stare, and squat about with the most abject expression of face, looking like a squad of slaves resting on their way to the coast. At Behobeho the inhabitants are principally made up of two small tribes, which, to avoid being exterminated, joined the Wakhutu. Mgunda again is formed by a colony of Wanyamwesi, who have taken possession of the ruling powers of the country, the chief, Mgunda, being of the same race. The latter informed me that he was in a short time going to make war on the Walugulu "in order that they might become friends." After a detention of four days collecting food for five days' jungle march, and by heavy rains, we started for the Ruaha on the 18th of July, by which time I had recovered from the fever which had troubled me.

The road which led to M'henge and the Ruaha was so little used that four men had to go in front with knives and axes to cut the way clear through jungle and forest. The first two marches took us through a small valley, at the head of which stands Mgunda, the only village in it having been cleared by the Wamahenge. It is now covered with grass 8 or 10 feet high. Through a narrow tunnel of this grass we slowly moved, and nothing more dreary could be conceived. The valley is formed by low, well-wooded hills running north and south, and there are a number of small streams, the main one being the Msendari, along which a large part of our route lay, and which reaches the Ruaha by a gap in the southern extremity of the valley. Two days' march brought us outside the valley, and after passing through a fetid swamp, we camped within a day and a half's march of the Ruaha.

On the 20th we had a long tramp through broken ground covered with small trees and short grass. The intrusive basalt once more reappeared here, tilting the sandstones at a high angle, W.N.W. After marching all day we camped beside a small stream near the Ruaha, and on the following morning reached that river.

At first sight the River Ruaha looks promising, but subsequent experience of it proves disappointing. Where we reached it, the breadth is about 150 yards, the depth, for 40 or 50 yards among rocks, 8 or 9 feet, the rest varying from 2 to 4 feet. It had yet a month before reaching its lowest, when it is reduced at its deepest to about 4 feet. It here flows about due north and south, but only for a mile, when it turns more to the east on the one hand and to the west on the other.

But besides its want of depth, it has defects which will make it perfectly impassable even for canoes. About a quarter of a mile north of our crossing-place there are rapids; as much south, a rocky barrier stretches across, leaving only about 20 yards for the passage of the water in a swift current. A little further south there is still another rocky barrier, this time leaving only a number of small passages through which the water rushes. No boat or canoe would ever venture to pass through such a place. The rocks dip at a high angle W.N.W.

On arriving at the river, we at once opened out Admiral M'Donald's little folding boat, which had been carried all the way by two men, and launched it with the name of the *Agnes*. The prospects of our trial trip seemed most discouraging, and we looked forward to loss of bales and two days' hard work. To assist the boat we tried to throw a rope across the river, but from deficiency of rope failed in all our attempts. Two or three trips of the *Agnes* across the river put the men into better working order, and our hopes rose each time, till we began to admire her powers. In the afternoon, a rotten canoe which had been conveying Wamahenge warriors across, came to our assistance, but the great part of the work had to be performed by the *Agnes*, which between 10 A.M. and 6 P.M. conveyed across 100 men and 120 bales without the damage or loss of a single article. I came to the conclusion that Admiral M'Donald is to be congratulated on his ingenious and useful invention.

We had at last entered M'henge, but there were still two days of jungle and forest before reaching the inhabited portion of the country. Of the physical features of the ground there is little to notice. To the north, at a distance of six or eight miles, we had a high range of mountains trending north-east and south-west, while west and south of us nothing but jungle and forest could be seen. On the line of our route the ground was on the first day's march much broken, and the drainage was towards the Uranga. On the second day we entered level ground, half jungle, half forest, and after crossing two marshes reached Joto.

The rest of our way through M'henge was entirely through jungle, with cultivated tracts here and there, forest only seen along the base of the mountains and the sides of the Ruaha and Uranga, and the ground quite level, evidently formed by alluvial deposits from the two rivers. From Joto three marches brought us to the chief's town, Mkomokero.

At Pangalala the chief told me to stay and show myself to the people the next day. Not being inclined to be lionised, I promptly informed him I would not stay; but what the chief could not compel me to do our men did, for they struck for a day's rest, saying they were not used to so many marches at once without a stoppage. I tried to induce them to go forward to Mkomokero, but all my arguments were of no avail, so I had to succumb. That same night the men danced like demons till twelve o'clock, amidst yelling, singing, drumming, &c., till one might have imagined they were in the lower regions; and yet they had declared they were all too tired to move forward.

While thus detained I employed the time by ascending one of the mountains of the ranges which have been cut out of the edge of the plateau inhabited, to the west, by the Uhehe, but as at Behobeho, before reaching the top I became too sick to proceed further. The day also proved to be misty, so that I got few observations of any consequence, except a sight of the Behobeho Hills.

The mountain, Chang by name, is of gneiss of a very hard and compact nature, dipping south-east, and weathering out into huge rounded blocks, forming a brick-red sandy soil. At this period my men were very troublesome. Knowing they were now on a short caravan route to the coast, they presumed upon their knowledge, and were constantly making extravagant demands, which were with difficulty avoided. From Pangalala we marched to Majuroko, a village principally distinguished by a general want of perpendicular walls to its houses, which were nearly all inclined at an alarming angle. The following day, a short march through cultivated ground, passing the harem of the head chief and crossing the River Mema, a large stream from the M'henge Mountains, and flowing to the Uranga, we entered Mkomokero, amidst a great waste of good powder, much to the delight of the men who, like boys, are much pleased with any kind of noise.

The head town of M'henge is of the most irregular character, no one house being placed in a line with another, and none resembling any other. The day following our entrance we were visited by the head chief, who was only distinguished from his subjects by the extra amount of castor-oil about him, so that he could be found in a crowd quicker by the nose than by the eyes. On asking for a guide to Ubena, he said to my alarm that we would speak about that again, and in the meantime I was to stay a few days that his people might see me, no white man having been there before.

It was no use talking or arguing with him, I could get no guide, and for four days I had to stop, and it was only after giving him two barrels of gunpowder that he at last gave us two guides who knew only half the way.

While thus kept virtually a prisoner, I took the opportunity of visiting the Uranga, which is only about four miles from Mkomokero. After a two miles' walk we had to take to canoes, as the river is so lined with lagoons and swamps that it is impossible to reach it in any other manner. At this place it is divided by an island, and the huge sedges cut off any possible view of it either up or down. The part seen is about 50 yards broad, with a slow current and very deep, no bottom being reached by a very long pole. The fishermen said that the other branch was very much broader, and that as far as they knew it was all like what we saw as far as the Lufigi. I think there can be little doubt that it is navigable for the largest river boats as far at least as Mkomokero; but beyond that I could get no information, except that it flowed through the country of Ganga, in which there were very few people about whom nobody knew anything, and to which there were no roads.

It had been my intention to try and follow the Uranga as far as possible, but in the face of such circumstances I had to give up my project and take my way through Uhehe.

On the 1st of August we recommenced our march, and in four days, camping at Gambula, Mtolehera, and Paliogoalima, we reached Pakachewa, without any incident of importance occurring. At this place I was once more exhibited to the people for "one day only." The chief informed me on the day of my arrival that I was to remain throughout the next day, which I said I would certainly not do. But on leaving my tent the following morning I found the guides had been so frightened that they dared not go on with us for fear of the chief. I stormed and offered more cloth, but they remained unmoved, and I was accordingly exhibited as far as my wrath would allow of such exhibition.

On the 6th a two hours' march brought us to the River Luipa, which flows from the M'henge Mountains to the Uranga, and is about 12 yards broad and 10 to 12 feet deep, flowing with a swift current. The *Agnes* was once more launched, and did excellent work in landing men and bales safely on the opposite side. After vainly attempting to get more cloth our guides here deserted, and it afterwards turned out that they did not know the rest of the way. However, in the evening we got another from Pakachewa. On the following day we reached the village of M'matanga, on the further confines of M'henge, after passing through a somewhat broken country covered with part forest, part jungle.

Let me now say a few words regarding M'henge and its people.

The inhabited part of the country of M'henge is comparatively small, not occupying more than 40 miles north-east and south-west, along the base of the mountains which I have spoken of as the M'henge Mountains. In breadth it will be nowhere more than 20 miles, though in name the country occupies the whole of the angle formed by the junction of the Ruaha and the Uranga. From its proximity to the mountains, and from the level nature of the ground, it is kept constantly damp throughout the year, and with a hot sun must be one of the most fertile tracts in Eastern Africa, though it may not be the most healthy. All the cereals, and most of the vegetables, of the coast are grown. Tobacco is produced very extensively, and cotton occurs, but is not cultivated.

The people are evidently a very superior race compared with the Wakhutu or Wazaramo. They are much lighter in colour, and have far superior features. The men have good figures, though many of them are somewhat effeminate in this respect. Hair on their face and head is also unusually abundant. The women, on the other hand, are short and stout, few or none being good-looking. Many, however, have not the pendant breasts so characteristic of East African women. The people know very little of their origin further than that they came from the south, and that previously to their settling in M'henge they did not use shields. Their language, however, may in future give some clue to their origin, as it is identical with that of the Wagindo, Wanindo, and the Wapanga, who live further south. One of our porters, who had been brought up in Gindo, spoke the M'henge idiom quite easily, although he had never been in the country before.

The Wamahenge dress in a somewhat varied style. The most common fashion among the men is a strip of cloth of the narrowest dimensions, brought up over a cord round the waist before and behind. The women have simply two pieces of cotton, each about one foot square. Bark cloth and pieces of skin are also frequently used. Their houses are generally built on poles, and some of them are of the most peculiar character, testifying to the ingenuity of the people. There are houses of basket-work, some of millet stalks of the common Khutu form, others again of grass stalks. The most peculiar form is that in which the house is built on a platform, with a huge roof (the house being circular) projecting all round and reaching a much lower level than the platform, so that nothing is seen but a huge cone elevated on poles. They keep their fowls and goats in separate houses. Their dead they bury in the position they love so much in life, that is, sitting with legs doubled up and arms clasped around them. The wives and female relations of a defunct M'henge clothe themselves in cords and sit outside the house for a certain number of days. They have many curious customs and fashions, but I must wait for leisure and more favourable circumstances before entering into greater detail.

It was with a feeling of great relief that I found myself on the outside of this district, at the foot of the Uchungwe Mountains. This range, like the M'henge Mountains, is simply cut out of the Uhehe Plateau by the long-continued action of streams; but the hills are very much more irregular in form than the latter, from the stream cutting more across the strike of the rocks, while the streams of the M'henge Mountains follow the strike and have thus produced a series of short ranges trending north-east and south-west.

Quitting M'henge, we were informed that by the best route we should be able to cross the mountains in three days, and that there would be only one day in which we could not get food. This road was pointed out and guides were supplied us. They said there was another road, but that it was not nearly so good as the one they spoke of. Trusting to this information, we started and nearly got starved in consequence. What in the distance looked like an unbroken range, proved to be a large number of mountains. Some of them were excessively steep, and tried all the men's powers in climbing; up and down, up and down we went one after another; ascending 1000 feet to descend as much on the other side. The men of course with heavy loads could not go far in one day, and it was wonderful how they could thus march for hours together. The three days thus expanded to eleven, and it was only with the greatest exertion that about half the usual amount of food was gathered together each day from the various isolated houses on the surrounding hills. On two days no food was to be got, and the men appeared likely to have to go without any, or take the preserved meats which I was on the point of issuing out, although they would have done little good. On each occasion a bullock was brought in to sell, which carried us on for the time being.

The Uchungwe Mountains trend north-east and south-west along a part of the great plateau which stretches to the west. There is no main range, but simply a number of mountains trending generally north and south, rounded in appearance, and covered with vegetation, forests of large trees occurring even on the highest points. From east to west there is a general rise in altitude up to 7000 feet on the edge of the plateau, which at the point where we leave the mountains is 6700 feet in height. The drainage is south to the Uranga till we reach the western side where one large stream, the Ecose, runs north to the Ruaha. There are a few inhabitants scattered over the different mountains, living in isolated houses perched even on the highest points, and there they cultivate a few sweet potatoes, indian corn, and a grain called unliza. The men go absolutely naked, not having even a few beads, and the women are not characterised by the possession of a large amount of cloth. They are well made, muscular people, and have not the weatherbeaten aspect which we might expect from such a life.

Our passage across the mountains, besides hard climbing and want of food, was made vastly more uncomfortable by the almost continuous mist and rain, which also contracted our view of the surrounding country. As far as we saw through the misty atmosphere, the scenery might be described as neither grand nor beautiful; the outlines were too smooth and rounded to produce such effects, and it was only along one or two of the streams that the eye found anything to rest on with pleasure; in such places ferns of all sorts grew in profusion, from the tree-fern to the small Asplenium peeping out from beneath the rock.

From a height of 6700 feet (bar.) we started on the 18th of August on our march across the great plateau of Eastern and Central Africa. The country is undulating, with the drainage south to the Ruaha. We camped at a row of mud-built houses with flat roofs of the same material, and as no food was to be got, we were glad to get off on the following day, and passing through an uninhabited country and over some low hills, we once more reached the Ruaha near the large village of Mwhana. At this place the river is six yards broad and 10 feet deep, flowing swiftly north between mud-banks, with trees meeting overhead and hanging down into the water. There being no bridge upon which we could trust the loads, the *Agnes* once more crossed the Ruaha, and by means of a rope all the bales were safely landed on the opposite bank in an hour and a half, the men crossing by a rickety bridge. Calculating from the height of Mwhana (5602 feet by boiling-point), the Ruaha at this place is about 5200 feet.

On reaching Mwhana, a mile further on, we found the place all astir. We had sent one of our men forward in the morning to announce our approach. On his arrival, some hours previous, he had found the headman fled, the women sent off to the mountains, and the men turning out fully armed. It appeared that they had heard of the arrival of a body of men; and it being the custom for caravans to send a day's notice, it was supposed because we had not done so that we meant war. The arrival of our messenger helped to allay the excitement.

Three marches from Mwhana, through a bleak moorland-like country, with one rounded ridge succeeding another and trending north and south, and huge blocks of granite protruding everywhere, with hardly a sign of human habitation, brought us to Misimiki, the second chief's town. The latter proved to be an excessively greedy personage, and it was only after satisfying all his demands that he would allow the people to sell us food, and he kept us two days before giving us guides to the head chief. As he was evidently suspicious of our intentions, we were told the most extraordinary lies in answer to our questions regarding surrounding countries, and the different roads and distances. Food was here so scarce that we could hardly collect sufficient for each day.

Four days' march brought us to Mkubwasanga, the town of the head chief of Uhehe, through a bleak uninhabited country, where even grass can barely take root in the hard clay, and grows in stubbly tufts. On the second stage of our route, and when on the point of camping, a messenger arrived from Mamlo, the chief, saying that he was greatly displeased because we had not previously sent him notice of our arrival, and he was now going by his own road to Misimiki (the chief having a special road by which he passes from place to place), to stop there, while I was to go on to Mkubwasanga, and remain there during his pleasure. This indeed was unpleasant intelligence, and meant I was to be kept indefinitely a prisoner. However, I could not help myself, so on we marched, and hoped that the soothing sight of a good present would soften his heart.

On the following day a much more serious incident occurred, which nearly wrecked the Expedition. A very cold wind was blowing, and about midday the men stopped to make fires to warm themselves. After an hour's rest I ordered a start, but as some of the men wished to camp there, although there was a tembe about an hour's march further on, little movement took place; annoyed at this, I seized my water-bottle, and cleared the place in a surprisingly short time, with the exception of two men who said they would not go on. For such rank mutiny I said I would fine them four dollars. In about an hour they followed the caravan. In the evening a large number of the men came and declared that if these two men were fined, all the party would desert. As I did not believe it, and wanted to test the men, intending to give in if the case became serious, I remained firm. The consequence was that they laid down all their guns and accoutrements, and that night, over the whole camp there was nothing heard talked of but the different routes through Uhehe and Urori to Unyanyembe, Ujiji, &c., the speakers displaying a surprising knowledge of the whole surrounding country.

In the morning I turned out of my tent with somewhat anxious feelings. One of the men blew a horn, and to my amazement every man, with the exception of the headmen, cook, two boys, and three porters, one of whom had his wife with him, marched out of camp; some running, some singing. On seeing such a stampede, involving utter ruin to the Expedition, I at once ran after them offering to remit the fine, but no heed was paid to me; Chuma and the other headmen also did their best. On we ran gesticulating and shouting for a whole mile before we could get any of them to stop for a palaver. However, we succeeded at last in inducing them to listen, and after an hour's discussion, during which I made one or two small concessions regarding fines, we all marched back to camp, the loads were lifted, and, as if nothing had happened, we took the road for Mkubwasanga, arriving there after a short march.

The town turned out to be the worst collection of huts we had yet seen in Uhehe. The country of Uhehe, though an ever-changing quantity, reaches at the present time from Usagara in the north to the Konde Mountains in the south. In the east it is bounded by M'henge, Ganga, and Makangwala, and west by Urori. It includes Ubena, which is simply the district where the chief of Uhehe resides. Machinga, as it is called in Captain Elton's book, is a country which has no existence, that being the name which the Wahehe took from their chief, whose name it was, during the war with Merere when Captain Elton passed through the country of the latter. Since the second war with Merere, large tracts of Urori have been annexed to Uhehe.

In its physical features the country is most dreary and monotonous. Continued undulation of ground is one of its most characteristic features, the ground rising from broad shallow valleys to form smooth rounded ridges, to fall down again, forming another shallow valley and then another ridge. The direction of these ridges is north and south, and is determined by the drainage, which as far as we have seen is in that direction. A dreary moorland-like country it is, with long tracts of scrubby trees, and an occasional large acacia or tree euphorbia, alternating with grazing-grounds, which at this period form yellow fields of burnt-up grass. The soil is mostly a stiff red clay, which becomes in the dry season as hard as rock, and hardly supports any kind of vegetation; hence the greater part of the country is a sterile waste, incapable of affording grazing ground and useless for cultivation. It is only when the clay becomes sandy or changes its character that we find good grass and a little cultivation.

The Wahehe are upon the whole a rather good-looking class of negroes, not very dark-coloured, and having fine muscular figures. One of their most marked characters is the total absence of hair on their faces and bodies, and the scantiness of it on their heads; I have not noticed a single individual with hair on his face. Their language has evidently considerable affinity to that of Kiswahili, many of the words being nearly alike.

In the matter of dress they are very simple, and wear indifferently forty or more yards of cotton in a single piece, or go perfectly naked. About one half of the people go in the latter condition, and the others, when they have anything to do, begin by taking off their clothes. The manner in which some of them wear this vast amount of cloth is very picturesque and classical, the effect being heightened by the long wands which they always carry. During windy days their whole attention is taken up in keeping it from being blown away. As a rule, however, they have to carry it rolled up in a bundle in their arms, and it is a continual source of annoyance to them. The women in the most fashionable style wear a piece of skin behind, cut into three strips and ornamented with beads, an apron of kaniki in front and several pounds of beads, to which latter alone, indeed, they are not infrequently reduced, as their sole apology for a dress.

The houses of the Wahehe are square, flat-roofed buildings of mud and grain-stalks or poles, the roof being of similar materials. They rarely occur separate, but joined together for their mutual benefit, forming villages of three kinds, viz. 1st. Simple houses, with the cattle occupying one portion and the people the other. 2nd. Double houses, in which the front part is occupied by the cattle and extends sometimes 100 feet or more without partition, the people living in the back part; and 3rd. The tembe form, in which the houses are built so as to form a huge quadrangle, where the cattle may move about or go into their houses. The people depend to a great extent upon their cattle, and very little ground is cultivated, producing two species of millet and indian corn, and here and there sweet potatoes. They eat their meat nearly raw.

The climate, judging from the experience I have had of it, must be very trying. The temperature varies throughout the twenty-four hours from above 80° to below 50°. An exceedingly cold wind blows across the plateau from the north-west between sunrise and sunset, and on cloudy days becomes very trying. I have been very glad to put on an overcoat at midday on such occasions. Under its influence the men shook and shivered, and had to stop twice and build fires to warm themselves when on the march. Most of them complained of pains in their legs and feet, and a large number were walking quite lame. There is a very long dry season, during which little rain falls.

Mamle, the present chief of Uhehe, is not the legal possessor of that position. After the war with Merere, Machinga died, and was succeeded by his son according to custom. Mamle murdered the latter and made himself chief. He then declared war against Merere, defeated him, and now occupies a large part of the latter's territories. The rest of the country is quite broken up, and ruled by the various chiefs, while Merere, with the remnant of his warriors, seized upon Usafa, where he now resides.*

GEOGRAPHICAL NOTES.

Lake Nyassa.—The Free Church of Scotland have received letters from Livingstonia down to September 20th, by which we learn that the Rev. Dr. Laws had returned to that station on September 5th. Mr. James Stewart, C.E., then left with a party of natives in the *Ilala* for N'gkata Bay. Being joined there by Mr. Moir of the Trading Company, he started inland towards the Angone country and Kambwe lagoon. The party intended to secure more carriers and stores in that district, and afterwards to explore the country for a sanitorium, and to survey a road to Lake Tanganyika. Mr. Moir had previously made an excursion to the heights and on to the table-land, due west from Kaningina, into the very heart of Africa, on which occasion he was accompanied by William Koyi, a native convert educated at the Lovedale Institution, in Cape Colony. The two made their way as far west as Kambomlo's, where their food supply was exhausted, and they had to trust to their rifles for zebra soup and buffalo and even elephant meat. They came to the conclusion that Bandawa is a better site for a sanitorium than Kaningina, but the settlement of this and other important questions was deferred until Mr. Stewart's return from his expedition to Lake Tanganyika. The missionaries at Livingstonia were hoping soon to hear of the arrival at the north end of Lake Nyassa of Mr. Thomson, the leader of our East African Expedition. As will be observed on a comparison of dates, this event would occur only a few days after the despatch of the Livingstonia mail, Mr. Thomson having reached the shores of the lake on the 22nd of September. As he was to start for the southern end of Tanganyika on the 28th of the month, he would be some days, or perhaps weeks, in advance of Mr. Stewart's party travelling in the same direction.

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* A letter of later date than the above Report has since been received from Mr. Thomson. He has overcome his difficulties in the Uhehe country, and reached the northern shores of Lake Nyassa. This letter is given in the present number, p. 134.

Fourth Belgian International Expedition to Central Africa.—With a view to replacing Dr. Dutrieux and Lieutenant Dutalis, who are returning home, the International African Association have sent out M. Adolphe Burdo, one of the few Belgian travellers who have had any experience of the climate of Central Africa. M. Burdo was originally a member of Comte de Semellé's expedition to Western Africa, but, separating himself from it, he devoted his attention to the Lower Niger and a small portion of its great affluent, the Binue—of which work he has quite recently published an account at Paris.* M. Burdo left for Zanzibar on December 10th, taking with him as assistant, M. Roger, who has also already been in Africa. On their arrival at Zanzibar, the fourth Belgian Expedition will be rapidly organised, and with a light caravan will endeavour to reach as quickly as possible the Station which M. Cambier is now engaged in founding on the eastern shore of Lake Tanganyika. Afterwards M. Burdo will accompany M. Cambier or M. Popelin, as the case may be, to Nyangwé, on the Lualaba, where the second Station will probably be established, and he will then make his way westward to meet the third Belgian Expedition under Mr. H. M. Stanley, which is ascending the Congo.

Operations of the French Committee of the Belgian International African Society.—M. Savorgnan de Brazza, the leader of the late successful expedition to the sources of the Ogowé, has again sailed for West Africa, charged by the French Committee of the Belgian International Society with the task of founding the first "Station," or civilising centre, in the African interior. The Station is to be formed at some suitable locality on the Upper Ogowé. M. de Brazza sailed from Liverpool for the Gaboon on the 3rd of December.—The French Government have granted a total sum of 22,000 francs towards the expenses of M. de Brazza's undertaking.

The Contemplated Trans-Saharan Railway.—Under the auspices of the French Government four expeditions will endeavour, during the present winter, to penetrate into the regions through which it is proposed that the Trans-Saharan Railway should run. Of these, three will start from the side of Algeria, of which the most important will be under the direction of Colonel Flatters, formerly commandant of Laghouat. This party will be escorted by 200 picked natives, and will have for its object the examination of the centre of the Sahara. The fourth expedition, under M. Paul Soleillet,* will start from St. Louis on the West Coast of Africa, and will make for Timbuktu, by way of Tishid and Arauan, up to which place its route will be nearly E.N.E. from the coast, for M. Soleillet appears for the present to have given up his former plan of attempting to reach Timbuktu from Ségou. From Timbuktu his intention is to go northwards to In-Çala, which is the most southern point he attained in his expedition of 1872–3 from Algeria.

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* 'Proceedings,' vol. i. p. 811.

Exploration of the Binue Branch of the River Niger.—The Church Missionary Society have received intelligence of the safe return of their steamer *Henry Venn* from its pioneer voyage up the Binue, referred to on p. 787 of our last volume. The Expedition left Lukoja at the confluence of the two great branches of the Niger on July 8th, and on August 28th arrived opposite Yola, in N. lat. 9° 16′ and E. long. 12° 31′, 364 miles to the eastward in a straight line. By river, of course, the distance is much greater, for it is 390 miles from Lukoja to Hamaruwa, the furthest point reached by Dr. Baikie and Mr. (now Bishop) Crowther in the *Pleiad* in 1854, and Yola is probably more than 100 miles higher up the Binue. From Yola the *Henry Venn* proceeded up the river, past the junction of its tributary, the Faro—where Dr. Barth crossed in 1851—and for about forty miles still further, where she at length anchored on September 4th, off some rocks opposite a town called Garawa in N. lat. 9° 28′ 45″ and E. long. 13° 26′. Then, as the water was falling, it was thought prudent to return, but before doing so, Mr. Ashcroft took his small launch some miles further. It is stated that the total distance traversed by the Expedition from the mouth of the Niger was not much under 800 miles. Mr. Ashcroft describes a fine race of aborigines, inhabiting the district between Hamaruwa and Yola, among whom Mohammedanism is unknown. These people were clothed, and in no part of Africa had Mr. Ashcroft seen so many flourishing towns; there was a good-sized one every mile along the bank of the river for a long distance, and the land was rich and well farmed. A very minute and useful chart of the hitherto unvisited part of the Niger was made by Mr. Flagel, assistant to Mr. Ashcroft. We are promised a full account of this interesting exploration at one of our meetings,—drawn up from the report of the voyage by Mr. Hutchinson.

The Sikkim Himalaya.—M. Moritz Déchy, an accomplished Hungarian traveller and Alpine climber, has recently returned from an attempt to penetrate into Tibet by unexplored paths through the mountains of Independent Sikkim. Accompanied by one of the best Swiss guides and making Darjiling his starting-point, he entered by the deep and narrow defiles at the southern foot of Kinchinjunga, intending to cross the frontier ridge by high glacier-passes into Tibet; thus gaining an entry by unfrequented paths, unguarded by the jealous Tibetan authorities, and exploring the neighbouring region as long as his supplies lasted. He travelled with few men and with light baggage, consisting chiefly of preserved meats and his instruments, and hoped to be able to see a good deal of an unexplored corner of Tibet in the course of the few weeks he should be able to hold out. His plans, however, were frustrated by serious illness, caused by the malaria of the deep and humid gorges through which his party marched in the first stages. Two marches above Yoksung, the last inhabited place, at an altitude of 9000 feet he nearly succumbed to a first attack of malarious fever; but, recovering after a fortnight's rest, he continued his journey and attained a height of 14,000 feet at the base of Kinchinjunga, when he again fell ill; his strength now giving way he was obliged to abandon his project. His return journey was by the Singálilá ridge, close to the Nepaul frontier, a route considered impracticable by the Anglo-Indian sportsmen at Darjiling. He crossed by high, snowy passes into Nepaul, and reached the Singálilá ridge without much difficulty; satisfying himself that this would be the best line for a trade-route, it being practicable to extend, at a small expense, the English road over the Singálilá to the point where the path leaves the frontier chain and penetrates the high northern district of Nepaul. M. Déchy was furnished with letters of introduction by Sir Henry Rawlinson, on behalf of our Society, and has since his return sent for our library a collection of photographs taken during his journey. He made a numerous series of hypsometric and meteorological observations, paying especial attention to the interesting subjects of nocturnal radiation and the diurnal variation of atmospheric pressure.

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* Vol. i. p. 787.

Routes between Jalalabad and Kabul.—A great desideratum in Afghan geography is a better knowledge of the various routes between Jalalabad and Kabul. The best known are the two which traverse the Karkatcha Pass and Khurd Kabul Defile, and the Jagdalik and Lattaband Passes respectively; both re-uniting at Bhutkhak. The first was explored by Wood in 1837, and the other by Sir A. Burnes in 1832. But the strategic disadvantages and physical difficulties of both routes are such, that it is most important that the Lamghan route north of the Kabul River, should be thoroughly examined. This road appears to have been followed by the Buddhist pilgrim Hwen Thsang on his way to India in the seventh century, and it is also alluded to by the Emperor Baber. Major Raverty, whose topographical knowledge of the country, as derived from native authorities, is unrivalled, has given a detailed description of the route, from which it appears that it diverges from the Lattaband road to the east of that pass, leads northward down the Tezin Valley, crosses the Kabul River, and thence may be followed with a general eastward direction through the fertile plain of Langhan as far as the large village of Mandrawar on the Alingar River, whence a route marked on our best maps leads across the last-named stream and continuing towards Jalalabad, crosses the Kabul River opposite that town. From recent letters from the *Pioneer* correspondent at Kabul we learn that General Macpherson made an effort to explore this route in November last, and would have no doubt succeeded, had it not been for a smart encounter with the Safis, who came down to oppose him in force numbering some 800 or 1000. They were dispersed with loss, but the results were serious enough, as far as our troops were concerned, to induce General Macpherson to retire after having explored only a portion of the route. A commanding position was however gained on the summit of a *kotal*, whence the road (which they were informed had been habitually used for military convoys by the late Amir) could be descried, winding through an open plain. There is also another route which trends eastward just before the Jagdalik Defile is reached, and which following the course of an unnamed stream leads with an easy gradient down to the junction with the Kabul River, 35 or 40 miles above Jalalabad. This road is known as the Adrak-Badrak Road, and it is even now used by *Kuchis* with heavily laden camels. Once the Kabul River is reached the southern part of the Lamghan Valley, full of villages and covered with cultivation, is entered upon, and a level plain, bounded on the south by the Siah Koh Range, extends up to Jalalabad. A gallery would probably have to be cut through the rock of this range at Darunta Cliff, but considering that the directness of this route, which runs due east and west, saves 20 miles over that by Jagdalik, the work would be well worth putting in hand. We learn that Mr. Claudius, assistant to Captain Holdich, R.E., is engaged in surveying this route and the adjacent country.

Mr. Alexander Forrest's Expedition in North-Western Australia.— Our Associate having now returned to Perth from his journey of exploration in the northern part of Western Australia,* we subjoin a brief outline of his work, condensed from the Australian papers, in anticipation of the detailed account which we hope soon to receive from the traveller himself. The party left the De Grey River in 20° 10′ S. lat. 119° E. long. on February 15th, 1879, and keeping from five to twenty miles from the coast, they travelled 400 miles northwards to Beagle Bay, discovering a large tract of country suitable for pasture. From Beagle Bay they went to King's Sound and then along its shore to the Fitzroy River. They followed the bank of this river for 150 miles to the south-east, and then for about 100 miles in a north-easterly direction. The river is described as a fine stream, navigable for small vessels for about 100 miles, and running through a rich country abounding with emus and kangaroos. The

* Vide vol. i. p. 277.

Fitzroy was crossed in 17° 42′ S. lat. and 126° E. long., and the party then turned north-west towards Collier Bay, making for the Glenelg River. For 140 miles they toiled along the base of a table-land 2000 feet high, until they were able to surmount the range, having accomplished which, a difficult hilly country lay before them. At last, when within twenty miles of the Glenelg, and when Stephen Range was quite visible, they were compelled to abandon the attempt to proceed further north, as the ruggedness of the hills was too great to enable them to pass with their horses, several of which died in the attempt. The party then returned to the Fitzroy, keeping some twenty miles south of their outward route, and after a necessary rest, they started on July 10th for the overland telegraph line, marching in an E.N.E. direction. They travelled 100 miles to the Dividing Range, which was crossed in 18° 10′ S. lat., and then 240 miles to the Victoria River, striking it near its junction with the Wickham. During this journey they discovered a vast extent of fertile country, abounding in grass, and intersected by numerous large rivers all running north and north-west. Great numbers of natives were seen, and for the most part they were fine, big men, but they had evidently never seen Europeans before. After leaving the Victoria River, Mr. Forrest and party came to an almost waterless country, in which their provisions began to fail. Accordingly, when about 100 miles from the overland telegraph line, Mr. Forrest determined to push on with one companion and obtain a supply of food. This, after terrible sufferings, he fortunately succeeded in doing, and then brought in the whole party to the Katherine Telegraph Station. They finally arrived at Port Darwin, some 200 miles distant, on October 6th, and proceeding to Palmerston the next day, embarked in a vessel bound for Sydney. In Australia Mr. Forrest's journey is looked upon as a very successful one, for he has determined a number of geographical questions, and opened up for pastoral occupation a vast tract of splendid country.

The North-East Passage.—Letters from Japan state that there is still hope of saving the steamer *Nordenskiöld*, which was stranded last August on a sandbank off the east coast of Yesso, when proceeding to the assistance of her namesake the Professor.* The Russian Consul at Yokohama reports that the ship has floated, and drifted some thirty miles from where she was lying, being now sheltered from wind and sea. The crew, who were on their way to Europe, have therefore returned to Yesso, and M. Sibiriakoff has decided to send out a new captain, who will, if possible, take the ship to Yokohama to refit. If successful, he will next year attempt the North-East Passage in the inverse direction, as originally intended. The new commander is the well-known Norwegian walrus hunter and Arctic navigator, E. Johannesen, who discovered the island "Ensomheden" in 1878. Johannesen's brother, who as captain of the *Lena* accompanied Professor Nordenskiöld round Cape Chelyuskin, and afterwards ascended the Lena River to Yakutsk, will go as second in command.

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* Vide vol. i. of the 'Proceedings,' pp. 3 (note), 208, 342, 706.

Ice in the Spitzbergen Seas in 1879.—Captain J. Kjelsen, in command of the sloop *Johanna Maria*, of Tromsö, attained an unusually high latitude on the Spitzbergen meridian last year, as did the Dutch Arctic Expedition in the Barents Sea. The year 1879 seems, therefore, to have been exceptionally favourable to the attainment of high latitudes in the European Polar Ocean; and the following extracts from an account of Kjelsen's voyage, which appeared in several Norwegian papers, may be considered interesting. Kjelsen, who is an experienced ice-navigator, left Tromsö on the 4th of June, and fell in with the ice on the 18th. He then worked along the edge of the pack towards Horn's Sound, passed Prince Charles' Foreland on the 1st of July, and on the following day was off the Norway Islands, whence no ice could be seen. A few days later, he fell in with Captains J. Isaksen and Sakariassen, who had been in Hinlopen Strait and off the Seven Islands, where they had found sailing ice. Up to this time Kjelsen had only killed three small seals, but Isaksen had already secured upwards of 50 walruses, 30 large seals, and six bears, while Sakariassen had also been fortunate. On the 7th of July, a northerly gale packed the ice along the northern shore of Spitzbergen, but on the 18th it opened out to the north and west of Moffen Island. The weather was then thick and rainy until the beginning of August, when the ice broke up in Weyde and Liefde Bays. In the meantime a great lane had opened in a north-easterly direction from Moffen Island towards the Seven Islands, and the ice began to drive seaward and disappear. In the beginning of September, the channel between Hakluyt's Headland and the ice was nearly 100 miles in breadth, and Kjelsen shaped course for the Seven Islands, off which he secured eighteen large seals on the 12th. He then sailed about 60 nautical miles northward from the Seven Islands, when a gale from the north-east, with fog and snow, compelled him to return to the southward. From the furthest point reached, no ice could be seen through a telescope from the crow's nest, and there was no ice-blink on the northern horizon. Kjelsen therefore considers that a steamer would have had no difficulty in making her way along the north and east shores of North-East Land. The exact latitude attained by the *Johanna Maria* is not mentioned, but it cannot have been far short of that reached by the Swedes in 1868 (81° 42′ N.), and may possibly have exceeded it.

Exploration in the Amazons' Basin.—Some members of the South American Missionary Society's station at São Pedro de Caxoeira, Rio Purús, early last autumn managed—but with some difficulty owing to the lowness of the water in the main stream—to make an exploration by steam launch of part of a small river called the Sepatiny [Sepatynim],* where there are Ipurina [Hypurinás] Indians; they also partially examined a small lake of the same name. The party had a five-mile current against them, when running up this little river, and steering was found extremely difficult on account of the number of the snags in the water and the narrowness of the channel. They did not steam more than a few miles up the stream, but hope to explore it more thoroughly on a future occasion.

Mr. Fowler's Explorations in British Honduras and Guatemala.—Although Honduras has been a British possession by right of conquest since 1798, in addition to claims by occupation since 1638, and acquisition by treaty (subsequently broken) since 1670, a considerable portion of the colony, especially in its southern part, has remained unexplored; and it has been reserved for the energy of Mr. Henry Fowler, the present Colonial Secretary, to supply some important and highly interesting particulars of this unknown region. In 1878 a small expedition was organised, partly under Government support, for exploring the Sittee River, and examining the country near the Cockscomb Mountains, chiefly to test the prevalent idea as to the existence of precious minerals in the interior. This expedition, however, failed after a month's hard work, finding neither minerals, timber, nor animal life; but the funds being unexhausted, a second party was arranged, under the leadership of Mr. Fowler. Starting from Belize on the 23rd of November, 1878, this gentleman, with two companions, Messrs. Drake and Worth, paddled up the Belize, or Old River, to the settlement called the Cay (meaning island) close to the Guatemalan frontier, at the junction of the small confluent called Eastern Branch. This part of the journey occupied ten days; the river banks were found to be settled in many places, with a population roughly estimated at 2000 (mostly of bad repute). Near the station called "Tea Kettle," a new road is being cut by Mr. Auguste, owner of the neighbouring land, which will connect the Belize Valley with the Guatemala frontier road to Peten, and thus greatly facilitate the transit of goods, bringing the Atlantic in competition with the Pacific traffic. Here the country to the south, towards the head-waters of the Belize, was even locally unknown, though many stories were told of the existence of gold in it. Having obtained Indian carriers, Mr. Fowler crossed the Guatemalan frontier beyond Banco Viejo, and striking in a south-westerly direction, reached Yaiché (89° 50′ W. long.). This portion of the journey was through a flat country, thickly wooded with cedar and mahogany in parts, and with some lagoons. Game of all kinds abounded, and many old Indian remains were found, as well as a large ancient ruin, now buried in forest growth, and possibly Spanish. Santa Thoriba (or Torribio) and Dolores were then reached by a south-easterly route, through open park-like country; here is the water-parting between the Atlantic and Pacific, the Belize (called Mopans) rising among the hills to the south-east, and the Machaquila flowing west. The rocks showed a sudden change; traces of ancient fortifications and of more modern Spanish occupation were observed, and old Indian pottery found everywhere. Though really Indian territory, the people are essentially Spanish, but with indications of reversion to the native type. Old Indian ruins are, however, still regarded with superstitious awe, relics being purposely destroyed. Magnificent mahogany, cedar, and other valuable timber trees were found in great quantity, and will be wasted for want of water carriage, until a railway is made along the country separating Santa Thoriba and Belize (which has a rise of only 1200 feet in 120 miles, with timber all the way). An expedition from Dolores to Peten Sük, where gold was supposed to have been found in some quantity, resulted in disappointment, though indications of that metal were observed on the road. Continuing his journey to Poctum, the most southerly point reached, an attempt was made to cut a way back direct to the Cay in a north-easterly direction, with the view of examining the southern affluents of the Belize. The matted vegetation, however, added to shortness of provisions, prevented the accomplishment of this, and a return was made to Machaquila on the former route, no results having been obtained beyond proof of the existence of gold-bearing quartz. Mr. Fowler is of opinion that the mineral district here is confined to a small area, near the head-quarters of the Belize and Machaquila, and probably somewhat to the west.

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* This river will be found laid down in about W. long. 65° 20′, S. lat. 7° 35′ on the map illustrating Mr. W. Chandless' "Ascent of the River Purûs," 'R. G. S. Journal,' vol. xxxvi. p. 86. The mode of spelling the names adopted by Mr. Chandless is given in brackets.

Having returned to the Cay by the same route, preparations were made for a south-easterly journey from that point to the Atlantic, across the unexplored part of British Honduras. Starting on the 27th of December, the party was accompanied to a little beyond the Indian village of San Antonio (where they were courteously received) by a guide from the Cay settlement, who refused to go beyond a creek, evidently the left branch of the Belize, which was the limit of local geographical knowledge in that direction. After fording this, a pine ridge was reached, the formation of the rocks here changing abruptly from limestone to slate, trap rock, granite, and gneiss, with reefs of felspar; and the country as far as the eye could reach, was a maze of hills, valleys, and water-courses, forming an admirable pastoral district. All the streams were apparently head-waters, and ran north and west. Very few deer were seen, and no other sign of life but a few birds, the stillness being oppressive.

In single file the expedition continued its course through forest and stream, and across valleys, until at an elevation of 1600 feet the first creek running east was met with. This was supposed to run into the Sibun, and showed that the divide of the eastern, northern, and western waters had been reached. Here game became plentiful. The elevations now increased gradually, and on the 30th of December, the Cockscomb Mountains were seen from a ridge 2500 feet high, some 20 miles off, in a south-east direction; the surrounding country was a bare plateau with gentle undulations and few trees, mostly oak. Next day the country was found more abrupt and rugged, the formation being slate of a very harsh description; the party in fact were crossing the western edge of the Cockscomb Range, which doubtless intercepts the general strata of the country running north-east and south-west. The work of exploration now became very arduous, from the steep rocky gulches, matted and entangled vegetation (in one place 15 to 20 feet high), and wet weather. Only two direct miles were accomplished on the 31st, during which a valley was crossed remarkable for the beauty and abundance of its wild flowers, especially orchids in full bloom. On New Year's Day a large stream running south-west was crossed; flood marks showed its rise to be some 15 feet, and it was even contemplated to raft down it. Its valley (1200 feet high) sharply divides open grassy country, and thick forest, having magnificent oaks, 60 feet clear to the branches, on its western slopes, and abounding with game. After crossing it and climbing the hills on the eastern side, the limestone formation was again struck with rich soil and large and plentiful timber, especially mahogany and cedar. An undulating country with hills from 1800 feet to 2400 feet high followed, with valleys running south-west and extensive plateaux eminently adapted for agricultural purposes, on one of which some curious Indian ruins were found, buried in the mould and vegetation of centuries. Another deep and broad river, with a strong current, and containing plenty of fish, was crossed; this was supposed to join with the one above mentioned, and so form the St. Yzabal branch of the Rio de la Pasion. On the hills beyond it, where the land at 2500 feet, and still higher, was good and rich, and apparently well fitted for coffee, vines supplied the water required; here Mr. Fowler had a narrow escape from a drove of infuriated "warree," or white-lipped peccary.

On the 5th of January, the head-waters of streams running into the Bay of Honduras were first met with, and the country seemed divided into regular short belts of good land, with plenty of animals, and rugged barren ground, exhibiting hardly an indication of life of any kind, save humming-birds, which were always observed on the wing even in the most desolate places. Clayey soil was here seen for the first time, and the formation again changed from limestone to flint and shale.

After more hill-work (some very steep), the open sea was sighted on the 7th of January, and a likely mineral district reached on the coast range. Favourable indications of gold were observed up to the highest point reached (3200 feet), and a well-defined reef of auriferous quartz (subsequently analysed at Belize) found on a hill-side, where one blast would dislodge tons of material. In this region (a distance of no more than 20 miles in a straight line from the coast at Port Honduras) extraordinary strata and evidences of volcanic agency were conspicuous; but the prospect of valuable minerals, so suddenly developed, fell off as a more stunted and scrubby country was reached on the other side of the ridge, where, however, sarsaparilla was noticed for the first time in extreme abundance, accompanied by vanilla. From the top of a hill here, a magnificent view was obtained of a broad valley, thickly forest-clad, 1500 feet below, bounded on the opposite side by a range of mountains intervening between it and the coast: its precipitous sides (in one place a sheer descent of 1000 feet), broken here and there by streams dashing through the gorges towards the sea in falls of 500 feet. Plodding on through rain and wet bush, and following the beds of creeks, with failing stores, the party gladly came (13th of January) on some mahogany works, on the southernmost branch of Monkey River (most appropriately named, from the droves of howling monkeys, probably *Mycetes villosus*, and other Simians haunting its banks). Crossing over to Deep River (the intervening space again affording strong indications of minerals), the party embarked at its mouth, and reached Belize on January 18th, after a two months' absence, the whole expedition having cost only 76*l.* 12*s.* As regards its results, topographically, the course of the Belize, as marked on Spanish maps, is thought to be too far to the west, so that Dolores, Machaquila, and Poctum in Guatemala, are nearer British Honduras than is generally supposed; and Mr. Fowler thinks that San Luis may be found to be actually within the borders of our colony. Economically, the fitness of this recently explored portion of British Honduras for agricultural and pastoral operations, and the adaptability of its climate for Europeans, from its elevation, are sufficiently shown by the above account (the actual temperatures observed by Mr. Fowler varied from 61° to 69° Fahr.). But the most important discovery is that of the indication of the existence of a mineral-producing belt, 20 or 30 miles broad, running north-east and south-west from the south of the Cockscomb Range into both Guatemala and Honduras, parallel to and distant from the coast about 25 miles. The proof of the extended range of mahogany, cedar, and other valuable timber is also of importance. Mr. Fowler's experiences have moreover dispersed the vague fear of ferocious natives in the interior prevalent at Belize—a fear doubtless owing to the sanguinary massacres by the Santa Cruz and other Indians in recent years.

The narrative of his explorations, with a short sketch of the History and Resources of British Honduras, is printed at the Government Press, Belize, and dated 1879.

Obituary.

Major Herbert Wood, R.E.—This distinguished officer, author of the well-known work 'The Shores of Lake Aral,' died at Chingleput, Madras, on the 8th of October last, at the comparatively early age of forty-two. He was the son of Lieut.-Colonel H. W. Wood, of the Madras Native Infantry, and was born on the 17th July, 1837. Being destined for the same profession as his father, he entered the East India Military College at Addiscombe, on the completion of his general education at Cheltenham College, in February 1854, and obtained his first commission in the East India Company's Engineers, on the 20th of September, 1855, immediately after which he was sent to Madras. In the Indian Mutiny campaign, which soon after followed, he was posted to the Saugor Field Division, in which he served with distinction, being present at the engagements of Jheejung and Kubrai, the battle of Banda, the action in front of Chitra-Koti, and the forcing of the Punghati Pass. He did duty with the column until March 1859, receiving the medal for the campaign. He was then appointed to the Public Works Department, in which he served at various stations, with intervals of other employment and of sick leave, until the close of his career. One of these intervals was his service as Field Engineer in the Abyssinian war, from January to June 1868, during which he had charge of the works at Zulla, and gained great credit, being thanked in the official despatches. In 1873 the state of his health obliged him to seek a long leave of absence from India, and he left for Europe on a three years' furlough. It was during this interval, in 1874, that he solicited and obtained from the Grand Duke Constantine, President of the Imperial Geographical Society of St. Petersburg, permission to accompany an expedition sent out by the Society to examine the Oxus, shortly after the Russian campaign in Khiva. He was the only British officer to whom this great privilege was accorded, and the amount of information he gleaned during the journey, especially with regard to the physical geography and intricate fluvial hydrography of the Oxus and Jaxartes, showed how well he profited by the opportunity. He wrote an elaborate paper on this subject for the Society soon after his return from the expedition, entitled "Notes on the Lower Amu-darya, Syr-darya, and Lake Aral, in 1874," which was published, with a map on a large scale, in the volume of our 'Journal' for 1875.—Returning to India in June 1876, he resumed his official duties, and in February 1879 was appointed Superintending Engineer of the Madras circle. His health, however, soon became worse, and in October he was seized with paralysis, under which he succumbed, on the 8th of that month.

The Madras Government on his death published the following order:—"His Grace the Governor in Council learns with much regret the death of Major Wood, by which event the public service has been deprived of the services of an officer of distinguished ability."

Mr. William Hepworth Dixon, whose sudden and unexpected death by apoplexy, in the middle of his busy career as a popular author, occurred on the 27th of December, had long been a member of our Society, having joined it in 1854. Although not a geographer in the usual sense of the term, he was an enthusiastic traveller, and in the accounts he published of his various journeys to distant countries, depicted, with his well-known graphic power, the social aspects of the people, and the physical features of their surroundings. These qualities characterised in an eminent degree a paper he read in 1868, before the Geographical Section of the British Association, at Norwich, "On the Great Prairies and the Prairie Indians." He also took part with good effect, at other meetings of the same body, in the discussions on countries which he had visited. This is not the place to enumerate the many works, in various departments of literature—history, biography, politics, criticism, and fiction—which this energetic and multifarious writer and fearlessly outspoken publicist brought forth during his literary life. It must suffice to mention, as forming the bond of connection with the more special subjects of our Society, the various distant journeys which he performed and their literary results. His first important tour was to Palestine and the adjoining countries in 1864, the narrative of which appeared soon after, under the title of 'Holy Land.' In 1866 he went to the United States, the chief literary outcome of which was his 'New America.' In 1869 he visited Russia, and during his tour diverged from the beaten track as far as Archangel, publishing on his return 'Free Russia.' In 1874 he made a second voyage to the United States, and lastly, in 1878, visited Cyprus.—Mr. Dixon was only fifty-eight years of age when he died, having been born at Manchester, in 1821.

REPORT OF THE EVENING MEETINGS, SESSION 1879-80.

Fourth Meeting, 12th January, 1880.—Sir RUTHERFORD ALCOCK, K.C.B., Vice-President, in the Chair.

PRESENTATION.—*James Muschamp Vicars, Esq.*

ELECTIONS.—*Robert Gervase Alford, Esq.*; *Captain F. Bailey*, R.E.; *Robert Capper, Esq.*; *Charles de T. Chamberlaine Bey*; *Charles James Fèret, Esq.*; *John Heaton, Esq.*; *Arthur Hoare, Esq.*; *P. A. Holland, Esq.*, M.A.; *John O. N. James, Esq.*; *Hy. Le Crèn, Esq.*; *Noblet Phillips, Esq.*; *Arthur Riches, Esq.*; *Richard Vause, Esq.*; *Stephen Wheeler, Esq.*

NEWS FROM THE SOCIETY'S EAST AFRICAN EXPEDITION.

Before the reading of the papers that had been announced in the programme of the evening, the CHAIRMAN said he had the pleasure of informing the Meeting that a very gratifying communication had been that morning received from Mr. Thomson, the successor of Mr. Keith Johnston in the command of the East African Expedition. Mr. Thomson reported, in effect, that he had successfully accomplished the first part of the exploration with which he had been charged by the instructions furnished by the Committee of the African Exploration Fund. He had reached, in September, the north end of Lake Nyassa. On his way to this point he had traversed a large tract of country that was previously entirely unknown, thus supplying a missing link in the knowledge of Central African geography. In approaching the north end of Nyassa, he passed to the eastward of the line taken by Consul Elton and his party, and he had established the existence in that district of a broad, rugged belt of tableland, rising to an altitude of 9000 feet, its western escarpment descending abruptly to the shores of Lake Nyassa. That escarpment had appeared to former travellers on the lake to be a range of mountains—the Livingstone or Konde Mountains. The Society would watch with great interest Mr. Thomson's further progress in the unexplored tract between the northern end of Nyassa and the southern end of Tanganyika. If he succeeded in this second part of his journey, he would ascertain how near the two lakes approached to each other, and what were the physical features of the country between them. If intercourse could be established between those lakes there would then be an almost unbroken chain of water-communication from the Nile down to the Zambesi, by way of the Albert Nyanza, Victoria Nyanza, Tanganyika, and Nyassa. So many deaths had recently occurred among the

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The Madras Gover
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Mr. William Hep
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1854. Although not a
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cheering to receive news of the
:—

LAKE NYASSA, *September 27th.*

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without accident of any kind,

a poisoned forefinger, I hope you
movements; in the meantime
points.
the Mbangala which joins the
in that region knew anything
two small tribes, called Wapangwa

the Lake.
rises from an altitude of about
to 8000 and 9000, representing the
by numerous streams into narrow
all the way to Lake Nyassa. No
and the highest point reached was
seen, and the Konde Mountains as

clay-slate till near Nyassa, where the

of Mbungo.
regarding our route to Lake Tanganyika,

JOSEPH THOMSON.

a later account of Mr. Thomson's

ZANZIBAR, *December 11th*, 1879.

mention is made of Mr. Thomson. He
September, and there left letters with
there at the Kambwe Lagoon. These

Zambesi Trading Company, and Mr. Stewart,
were to proceed by a road more to the
and try to reach Tanganyika with a
Mr. Thomson had passed on, some time

JOHN KIRK.

Rhodes' death at Matete, by fire, on the 20th

meeting would learn with great regret of
happened to Mr. Rhodes, a gentleman who had
journey from Lake Nyassa to the coast near
Rhodes lost his life in a most untoward and most
brought a candle too near a jar of spirit, which
ignited and burned Mr. Rhodes' face and body

so that he died almost immediately afterwards. He added that Mr. Thomson's previous report, containing a narrative of his journey from the east coast to within a few days of Lake Nyassa, was mentioned in Lord Northbrook's address at the opening of the session, on November 10th: the date of that communication being the 30th of August, it was evident that Mr. Thomson had made continued and excellent progress during the intervening time, since on the 27th of September he was on the borders of Lake Nyassa. A sketch map of Mr. Thomson's route would be published, together with the report in the 'Proceedings,' and he was quite sure that it would be regarded with great interest by all those who were desirous of promoting the further opening up of Central Africa.

Mr. Francis Galton wished to say a few words on a subject of physical geography suggested by Mr. Thomson's letter. It has been well known for a long time that a narrow current of great strength swept down the south-east coast of Africa, bringing warm water from equatorial latitudes, spreading to the south of the Cape in numerous streamlets, producing extraordinary variations of sea temperature in the same ocean districts, and thereby originating marked atmospheric disturbances and storms in those parts. It was also well known that the winds to the south of the Cape had certain peculiarities of direction, which compelled the outward and homeward routes of vessels when they rounded the promontory to be widely different. It seemed to him clear that all this depended very greatly on the physical conformation of the land of South Africa. Part of the work of the Meteorological Council, of which he had the honour to be a member, had of late been the discussion of the meteorological conditions of the ocean south of the Cape, and it became more evident from the recently plotted observations than it had been before, that one large system of winds swept circularly round the Cape. What was the cause of those winds? The southern part of Africa was a great plateau, across which the easterly winds that swept over the surface of the Indian Ocean could not blow, but by which they were deflected. The mountainous plateau which, south of Natal, rose to an average height of 4000 feet, increased in height at the latitudes of Natal and Zululand, and now it had been ascertained by Mr. Thomson that at the side of Lake Nyassa it attained a height of 7000 or 8000 feet. There could therefore be little doubt that the deflection of the wind began north of the channel between Mozambique and Madagascar, and that the current was produced by the deflected portion of the winds of the Indian Ocean that urged the sea before it, so that the peculiarities of the weather experienced far to the south of the Cape, and the different courses that had to be followed by outward and homeward bound vessels, were primarily due to the physical conformation of the south-eastern corner of Africa, beginning with that part of it which had been described in Mr. Thomson's letter.

The following papers were then read:—

1. "The Yellow River and Grand Canal, in China." 2. "Journey from Hankow to Canton, overland." Both by G. J. Morrison, C.E. They will be printed, with map and discussion, in the March number.

PROCEEDINGS OF FOREIGN SOCIETIES.

Geographical Society of Paris.—Second General Meeting of 1879: December 19th, Vice-Admiral De la Roncière le Noury, President, in the Chair.—The General Secretary, M. Maunoir, read his annual report on the labours of the Society, and on the progress of Geography during the year 1879. He dwelt more particularly on the grand voyage of Professor Nordenskiöld, and the recent Dutch Expedition to the Barents Sea.—Dr. J. Crevaux (surgeon in the French Navy) then read a paper on his recent journeys across the Guiana Mountains, from Cayenne to the Amazons, and from Pará to the Andes. In carrying out the mission with which he was charged by the French Government, he said he was at the outset detained at Cayenne by an outbreak of yellow fever in the colony from the end of 1876 to the middle of 1877; and was only able to start on the 6th of July of the latter year. He first ascended the Maroni to its sources, then crossed the Tumac Humac range, and descended the Yary to its junction with the Amazons. His next journey commenced on the 17th of August, 1878. Leaving Cayenne he ascended the Oyapok, and on the 5th of September arrived at the Camapi, an important tributary, whose upper waters approach those of two of the tributaries of the Maroni, viz. the Arua and the Inini. From the village of St. George to its source, the Oyapok offers an uninterrupted series of rapids and waterfalls, notwithstanding which the difficulties to be overcome are not so great as those of the Maroni. The traveller saw frequently on his route many marks on the rocks produced by the Indians with their hatchets, similar to those made by primitive men in the Stone Age. The transition from the rainy to the dry season, which happens about the end of September, is extremely critical owing to its unhealthiness. In spite, however, of his own illness, and that of his canoemen, Dr. Crevaux pushed forward to the River Ku and crossed in succession the districts inhabited by the Oyampis, the Rucuyennes, and the Calayuas, the last named of which are really only an Oyampi tribe having intercourse with the Brazilians. On the 10th of October he reached the Yary; he crossed the dividing range between the Yary and the Paru and embarking on this river he ascended it to its source, profiting by opportunities which fell in his way for thoroughly investigating the manufacture of the *curaré* poison. On the 8th of November he descended the Paru, the banks of which are much more numerously peopled than those of the Yary, but which proved of much more difficult descent owing to the innumerable waterfalls. On the 29th of December, after fifty days of canoe travelling, surveying his route all the way by compass, he reached the Amazons. He then proceeded in a river vessel to the Yary, reascended it as far as the Falls of Pancada, with a view to connect the itineraries of his two voyages, and then descended, proceeding to Pará, where he embarked for Europe on the 8th of January, 1879. He had no sooner trod his native land than he began to plan his return to South America. His intention was now to explore the Içа and Japurá tributaries of the Upper Amazons. Arriving at Pará he proceeded first to Tunantins, then to Tabatinga, on the frontier of Brazil and Peru. In his excursions in this neighbourhood, and on the River Javary, he had the good fortune to find in flower the plant which is used by the Peruvian Indians to poison their arrows, and was able to demonstrate that it is not the same as that used by the Guiana Indians in the preparation of curaré. From the frontier Dr. Crevaux returned to Pará, and spent some time on the island of Marajo, investigating the curious malady of the horses there, called *quebrabunda*, or paralysis of the hind extremities, which is identical with a disease called *beriberi*, of the Amazonian people. He then made another voyage up the Amazons, this time on his way to the Andes. From the Upper Amazons he entered the River Iça. He reached Cuemby on the Iça in forty-five days from Pará; and leaving Cuemby on the 16th of May, 1879, arrived after eight days' journey at the source of the Iça, in the Andes. From this spot, a walk of seven hours took him to the source of the Japurá, on which river he immediately embarked on his return journey. Here he met with the Carijona tribe of Indians, whose language has a remarkable resemblance to that of the Rucuyennes of Guiana. On the 14th of June he arrived at the great Falls of Araraquára, where he was compelled to abandon his last canoe; but he succeeded in purchasing another from the cannibal tribe Uitotos. This tribe carry on a slave trade with Brazilian traders, selling children and even infants change for common iron cutlasses, axes, and muskets. Armed with these ons the Uitotos make raids on tribes on neighbouring rivers, who are armed bows and arrows only; the able-bodied men are killed and the women and dren seized and sold as just narrated. Dr. Crevaux reached the Amazons on the of July, crossed the river to Teffé, and thence embarked for Manaos on his way France. He was accompanied throughout by his faithful negro attendant *Apatou*, om he has brought with him to France.—The following are the geographical sults of this remarkable series of rapid journeys:—Six rivers have been explored, wo (the Maroni and Oyapok) in Guiana, and four (the Yary, Paru, Iça, and the Japurá) tributaries of the Amazons. The Maroni, the Oyapok, and the Iça were previously but little known, but the Yary and the Paru were quite new ground, and the Japurá, a stream 1200 miles long, was unknown for four-fifths of its length.

January 9th, 1880: M. DAUBRÉE in the Chair.—A letter was communicated by M. Bran de St. Pol Lias, which had been received from Dr. Rück, scientific missionary in Sumatra, giving an account of geographical observations he had made during a recent excursion in the Batak country. He had found that the river indicated as flowing out of Lake Tebah to the north-east, and draining the waters of the plateau to the Indian Ocean, does not exist. The Batak Plateau on this side rises from 1000 to 1300 feet above the lake, and the river crosses it in a deep gorge with vertical walls. The drainage is collected by the Wampu River, which carries the waters to Sangkat, discharging them into the Strait of Malacca. Lake Tebah, which is shown on maps as closed on the south-east, is, on the contrary, open at that point to give exit to a river which flows to Assahan and probably to Padang, near Bedagueh, a place not to be confounded with Padang on the western side of Sumatra.—It was announced that the Minister of Marine and the Colonies had made a grant from the public funds to M. de Brazza, of 12,000 francs, as a contribution towards the expenses of his mission in Western Africa, and that the Foreign Minister had made a grant of 10,000 francs for the same object.—The President of the Geographical Society of Lyons announced that on the proposition of M. Soleillet, the Society had decided on calling a Congress at Lyons in 1880, for the purpose of discussing French interests in Africa.—M. Daubrée informed the Meeting that M. de Brazza had left Europe for Africa, on the mission with which he was charged, viz. to found in the western part of Equatorial Africa, probably on the Upper Ogowé or on the River Alima, discovered by him and Dr. Ballay, one of the Stations of the French Committee of the International African Association established by the King of the Belgians. The French Committee, of which M. de Lesseps is President, had formed an executive subcommittee under the Presidency of Admiral La Roncière, for the purpose of arranging M. de Brazza's Expedition. The Station on the east side of Africa would probably be founded in Usagara, the director chosen for the same being Captain Bloyet. Another Frenchman, M. Sergère, is about to establish a house of commerce at Tabora.—A paper was read on the Negroes of the Upper Nile Valley, by Dr. Mamy.

Geographical Society of St. Petersburg.—November 14, 1879: M. N. Severtsof gave an account of his journey in Ferghana and the Pamir in 1877 and 1878. The main objects of the expedition under M. Severtsof's command were the exploration and geographical description of the Pamir, and the investigation of its geographical and geological relations to the Tien Shan Range. We hope to give an account of the work of this important expedition in an early number of the 'Proceedings.'

American Geographical Society, New York.—A meeting was held at the rooms of the American Geographical Society on December 15th, to hear an account of the project for an interoceanic ship-canal, from Greytown, on the Atlantic coast viâ Lake Nicaragua, to Brito Harbour on the Pacific. Mr. A. G. Menocal, who has been making surveys and preparing estimates for such a canal, was the chief speaker, and he stated that during the surveys eight lines had been run in order to discover the greatest depression, and it was found that only two of the routes were practicable. These were respectively 134 feet and 43 feet above high-water level, and the former of these was selected, owing to the fact that it afforded greater facilities for drainage and for the diversion of the adjacent small streams during the season when floods come down from the mountains. The amount of fall had been found to be nine feet to the mile, and the lift of the locks had been fixed at 10 feet; it was also proposed to have a tide-lock at the coast, and at this point the canal was to be at the level of high water. Culverts were to be provided for the smaller streams, and it would be so arranged that any portion of the canal could be drained into the Rio Grande, leaving the locks dry. The proposed width of the canal at the bottom was stated to be 72 feet, and the slope adopted for the sides one foot vertical to six inches horizontal. The locks are at first to be 400 feet in length and 70 feet in breadth, and to be ten in number. The watershed along the proposed route was found to be 2000 feet in width, and the facilities for drainage ample. With regard to the Pacific side, the harbour at Brito was stated to be a very poor one and to require considerable improvements before it could be rendered of much use. The maximum rise on the Pacific side would be 1 foot 6 inches per mile. The bottom of the canal would be generally above that of the river, and very close to it. It was proposed to drain the small streams by siphons. Including the improvements to Brito Harbour and all contingent expenditure, the total cost of a ship-canal by the Nicaragua route was estimated at 13,000,000*l*. Danger from earthquakes having been suggested, Mr. Menocal said that nothing need be apprehended on that score, for he had never known an instance where the level of the water had been altered by them, and dams, erected by the Spaniards 300 years ago, were now in as perfect a condition as they were when first built. In the course of subsequent discussion Major Sidney J. Shelbourne, U.S.A., who is personally in favour of the San Blas route, stated that he did not consider the scheme proposed by Mr. Menocal practicable for the sum named by him, for he believed that not less than about 21,000,000*l*. would be required.

Geographical Society of Leipzig.—December 17th, 1879: Professor Dr. Delitsch, Vice-President, in the Chair.—A lecture was delivered by Dr. A. Penck, on "The Glaciers of Norway." The author had himself explored these regions, especially the Folgefonden and the Jostedalsbrae, the two most remarkable groups of glaciers, the latter alone comprising twenty of the first order. He compared the glaciers of Norway with those of Switzerland, and pointed out the differences between them.—A paper was then read by Dr. E. Kalkoussky, on "Volcanic Curves in Europe," showing that the whole of this division of the globe, with the sole exception of Russia, is intersected from north to south and from east to west by a series of lines of volcanic action, nearly parallel to and intersecting each other. He traced two principal lines: one from the Crimea to Lisbon, crossing the Balkan Peninsula, Italy, Sardinia, the Balearic Islands, and the southern Sierra and Spain; the other beginning in the north, at the Dal Elf in Sweden, and passing through Bohemia, the Euganees in Lombardy, through Italy and Sicily to the small volcanic islands between Europe and Africa. The spaces enclosed by these lines are always free from volcanic phenomena.

NEW BOOKS.

(By E. C. Rye, *Librarian* R.G.S.)

ASIA.

Gray, Mrs.—Fourteen months in Canton. London (Macmillan): 1880, sm. 8vo. pp. 444, illustrations, price 9*s.*

Contains many particulars of the inner life of the Chinese. There is no Index and not even a Table of Contents.

Guérin, V.—Description Géographique, Historique et Archéologique de La Palestine, accompagnée de Cartes détaillées. Troisième partie. Galilée. Tome I. Paris (Leroux): 1880, large 8vo., pp. 530, map. (*Williams & Norgate:* price 1*l.*)

The first and second parts of this work (Judæa, 3 vols., and Samaria, 2 vols.), were published at various dates from 1868 to 1875; and the present continuation is owing to the author's having in the latter year been entrusted with a mission by M. Wallon, the then Minister of Public Instruction in France, to explore in detail Upper and Lower Galilee. This work has been executed by him on the same scheme as that employed in the former volumes (the word "topographical" being perhaps more fit than "geographical" in rendering the title), consisting of individual observations on the localities visited, with no pretensions to surveying, and but slight attention to physical objects except in connection with history. The well-executed map (scale 1:210,000) includes from Sidon to Mount Carmel inclusively, and does not therefore illustrate the earlier chapters of the book. Only localities visited by the author are marked on it. His chief explorations were from Nazareth as a centre, in the Plain of Esdraelon and the Tabor district to the south, also north-east to the Lake of Tiberias, making various excursions from Tiberias itself, and after returning to Nazareth, reaching St. Jean d'Acre (of which a history is given) by Mount Carmel and Haifa. Here the first volume ends; but it is intended to extend the work beyond Galilee proper to the Decapolis, Gaulanitis, and Phœnician coasts.

Oppert, Ernest.—A Forbidden Land: Voyages to the Corea. With an account of its Geography, History, Productions, and Commercial Capabilities, &c. London (Sampson Low & Co.): 1880, 8vo., pp. 334, charts, pls., price 1*l.* 1*s.*

After pointing out in his preface that a very small further extension of power would enable Russia to permanently occupy the Corean peninsula and practically make herself mistress of the entire eastern coast of Asia down to the Sea of Japan, the author gives an account of the history, language, physical products, and general geography of Corea (pp. 1–176), followed by narratives of his own three journeys to that country. He avoids giving dates; but, from a statement on p. 178, it is probable that his first visit was not long after the opening of the ports of Japan. His second visit was soon after the murder of the French missionaries; and his third, after the French expedition. Though failing in his attempts to open friendly relations, he has carefully noted such details of the physical conditions of the country and habits, &c., of the people, as his opportunities permitted.

The charts are of the south-west approaches to the Saoul river, drawn up by order of the French Admiral Roze, and of the western or main entrance of the Kan-Kiang, from Tsia-Tong to Kan-wha-Foo (scale 5 miles to the inch), claimed to be discovered and first navigated by the author.

Ross, John.—History of Corea, Ancient and Modern; with Description of Manners and Customs, Language, and Geography. Paisley (Parlane): n. d., 8vo., pp. 404, pls., maps, price 10*s.* 6*d.*

There is nothing in this work (which is chiefly historical) to indicate a personal knowledge of the country by the author. The geography is a short compilation; the maps are not worthy of notice; and there is no index.

Schlagintweit, Emil.—Indien in Wort und Bild. Eine Schilderung des Indischen Kaiserreiches. Leipzig (Schmidt & Günther): 1880, fol. (*Williams & Norgate.*)

The first part (pp. 16, pls., map) of a copiously illustrated work apparently upon the same base as that of Rousselet. It is intended to complete it in about 35 numbers, price 1*s.* 6*d.* each.

AFRICA.

Amicis, E. de.—Morocco: Its People and Places. Translated by C. Rollin-Tilton. London (Cassell, Petter, & Galpin): n. d., 4to., pp. 406, pls., price 1*l.* 1*s.*

This account of the proceedings of the Italian Embassy to the Court of Morocco contains much information on the habits and customs of the people and the country on the road to Fez and Mequînez, practically the same as that given by the late Dr. Leared.

Bonwick, James.—Climate and Health in South Africa. London (Silver): 1880, sm. 8vo., pp. 125, price 1*s.*

A collection of records bearing upon the subjects named in the title, from the works of ancient and modern travellers, medical and other authorities, &c., and revised by W. C. Burnet, the Cape Government Emigration Agent. The influence of the physical conditions of each region is discussed separately.

Capello, Hermenegildo de Brito, and Ivens, Roberto.—Expedição Scientifica ao Interior de Africa. Observações Meteorologicas e Magneticas feitas pelos Exploradores Portuguezes. Lisboa (Sociedade de Geographia): 1879, fo., pp. 12.

Messrs. Capello and Ivens were provided with a Macneill barometer, an aneroid, and three thermometers, by Casella, and another thermometer by Baudin. Corrections of instrumental error are given, and the meridian of Greenwich retained. The meteorological observations commence on 18th December, 1877, at Quillengues, and continue during the journey to Caconda and thence to Bihé, where they cease on 15th April, 1878. The magnetic observations commence in October, 1877, extending from Benguela and Dombe to Bihé.

Jeppe, F.—Transvaal Book Almanac and Directory for 1879. Pretoria (Deecker), London (Algar; Street): 1879, 12mo., pp. 205, price 2*s.* 6*d.*

Contains instructions for fixing positions by solar observation in different parts of the Colony, a brief account of the tribal composition and numbers of its native inhabitants, and a sketch of its general position, boundaries, area, divisions, chief physical features, climate, products, &c.

(Moister, W.)—Africa: Past and Present. A concise account of the Country, its History, Geography, Explorations, Climates, Productions, Resources, Population, Tribes, Manners, Customs, Languages, Colonisation, and Christian Missions. By an Old Resident. London (Hodder & Stoughton): 1879, sm. 8vo., map, woodcuts, price 5*s.*

A general compilation, with no scientific pretensions, and apparently intended chiefly for mission purposes. The map, though on a very small scale, is well up to date; and there is a fair Index.

Pogge, Paul.—Im Reiche des Muata Jamwo. Tagebuch meiner im Auftrage der Deutschen Gesellschaft zur Erforschung Aequatorial-Afrika's in die Lunda-Staaten unternommenen Reise. Berlin (Reimer): 1880, 8vo., pp. 246, map, pls. (*Williams & Norgate:* price 6*s.*)

Dr. Pogge has not attempted to put his diary into narrative form, but simply reproduces it,—the want of an Index materially detracting from its value. It forms the 3rd part of the 'Beiträge zur Entdeckungsgeschichte Afrika's,' whereof the first two parts (separated from the Journal of the Berlin

Geographical Society) were published in 1873 and 1874, by H. Kiepert and W. Koner.

The present volume is divided into five parts, the first containing the author's daily experiences from St. Paul de Loanda, 15th February, 1875, to Kimbundo on 26th August; the second, from Kimbundo, 16th September, to Mussumba, 9th December; the third, the stay until 27th January, 1876, at the capital of the Muata Yamvo; the fourth, the journey south to Inschibaraka and Kanambande, and back to Mussumba and Malange; and the fifth, a history of the kingdoms of the Muata Yamvo and Cazembe, and an account of the manners and customs of the Kalunda.

The map, by Kiepert (scale 1 : 3,000,000), gives the southern half of the Congo Basin, from 3° to 23° S. lat., and reaching from the west coast to Manyema. It shows the routes of Dr. H. v. Barth and Lieutenant Lux, as well as the author's.

Sandemann, E. F.—Eight Months in an Ox-Waggon: Reminiscences of Boer Life. London (Griffith & Farran): 1880, 8vo., pp. 402, map, price 15*s.*

The author's route was through Natal to the Orange Free State and Transvaal as far east as the Portuguese territory beyond Lydenburg. The journey commenced in March, 1878, and though the work is mainly devoted to sporting, much incidental information on topographical matters and the present disposition of tribes, &c., is contained in it. The map is Jeppe's (scale 1 : 1,850,000) corrected to 1879.

Stuart, H. Villiers.—Nile Gleanings concerning the Ethnology, History, and Art of Ancient Egypt as revealed by Egyptian Paintings and Bas-Reliefs, with Descriptions of Nubia and its great Rock Temples to the Second Cataract. London (Murray): 1879, large 8vo., pp. 431, 58 coloured and outline pls., autograph sketch map, scale 48 miles to the inch, price 1*l.* 11*s.* 6*d.*

Independently of the archæological value of this work (which contains representations and descriptions of remains claimed to be hitherto unknown), it contains a double itinerary and tables of temperatures founded on a personal experience of three years: many points of topographical interest are also discussed in it.

AMERICA.

Canada.—Geological Survey of Canada. Alfred R. C. Selwyn, F.R.S., F.G.S., Director. Report of Progress for 1877-78. Published by authority of Parliament. Montreal (Dawson Bros.): 1879, 8vo., pls. (*Sampson Low & Co.*)

In addition to matter of purely geological character, this volume contains (1) A preliminary report by Dr. G. M. Dawson on the physical features of the southern portion of the interior plateau of British Columbia, descriptive of the Fraser and Thompson river valleys, the Shuswap Lakes, Kamloops, the Nicola River, the Simalkameen and Okanagau Valleys, &c., especially as regards the limit of agriculture, pastoral capabilities, zones of rain and other climatic conditions, mineral and floral products, and water system; (2) Reports on an exploration of the east coast of Hudson's Bay and on the country between Lake Winnipeg and Hudson's Bay, by Mr. Robert Bell, containing, among various geographical details, useful for a correct appreciation of those districts, a survey of the Abittibi River, and a table of temperatures of sea, rivers, and air along the Eastmain coast of Hudson's Bay, and lists of glacial striæ, and of the northern limits of many varieties of timber trees; (3) various Reports by Messrs. R. W. Ells, L. W. Bailey, and G. F. Mathew, bearing upon the physical geography of Southern New Brunswick; and (4) Report of Surveys and Explorations in Cape Breton, Nova Scotia, by Mr. Hugh Fletcher, in which the chapter on superficial geology is of special geographical interest. The economic minerals receive a prominent share of attention throughout the work, which is illustrated (in addition to many geological diagrams) by several plates from photographs of the scenery of the different districts.

Wiener, Charles.—Pérou et Bolivie. Récit de Voyage suivi d'Études Archéologiques et Ethnographiques et de Notes sur l'Écriture et les Langues des Populations Indiennes. Paris (Hachette): 1880, 4to., pp. 796, pls., maps, plans (price 1*l.*).

The author was entrusted in 1875 by the French Minister of Public Instruction with an archæological and ethnographical mission, which was brought to an end in August, 1877. The results, as given in this volume, consist of an account of his voyage occupying more than half of the work; archæological notes on architecture, sculpture, metallurgy, ceramic art and painting; and ethnographical material referring to the original inhabitants and their worship, and to the modern Indians. Historical notes, observations on the written language of the Peruvians, and Quichua-Aymara and Campa vocabularies complete the work. The author's itinerary along the Peruvian coast and on the inner slopes of the Cordillera to Titicaca are shown on a map (scale 1 : 9,300,000), with an inset (scale 1 : 500,000) of his ascent of Illimani, south-east of La Paz. There is also a plan of Cuzco (scale 1 : 5000). Many smaller maps in the text illustrate the topography of localities of archæological interest, and many of the plates (which however for the most part refer to ethnography or archæology) also render the physical aspects of the country. The want of an index, and even of a list of the maps and plates, is however a serious drawback to the undoubted value of the work as one of reference. The height of the peak of Illimani (to which the name "Pic de Paris" is given), ascended by the author on the 19th May, 1877, with MM. De Grumkow and De Ocampo, was 20,112 feet by aneroid and boiling point.

OCEANIA.

Lesson, A.—Les Polynésiens, leur Origine, leurs Migrations, leur Langage. Vol. i. Paris (Leroux): 1880, 8vo., pp. 523, map. (*Williams & Norgate*: price 12*s.* 6*d.*)

Published by Ludovic Martinet, from the Author's MS. After some general considerations, the work is divided into two parts, the first discussing the Melanesian races (Negrito and Papuan), the Polynesian (Malay, Javan, Malaisian, and people of the Caroline and Marianne Islands); and the second the origin of the Polynesians. The records and hypotheses of all available travellers and authors are utilised, with linguistic tables and occasional sketches of geographical features (occasionally also disfigured by national inaccuracies, such as "Sir Grey," "Lang's Dunmore," &c.). The map, on a small scale, shows the divisions of the groups.

Wolf, T.—Ein Besuch der Galápagos-Inseln. Heidelberg (Winter): 1879, 8vo., pp. 41. (*Dulau.*)

ARCTIC.

Hall, C. F.—Narrative of the Second Arctic Expedition made by Charles F. Hall: his voyage to Repulse Bay, Sledge Journeys to the Straits of Fury and Hecla and to King William's Land, and Residence among the Eskimos during the years 1864–69. Edited under the orders of the Hon. Secretary of the Navy, by Professor J. E. Nourse, U.S.N. U.S. Naval Observatory, 1879. Washington: Government Printing Office, 1879, 4to., pp. 644, photograph, pls., woodcuts, maps, and circumpolar map in pocket.

The late Captain Hall's first expedition was from May 1860 to September 1862 (furnishing the material for his 'Arctic Researches'); the second one (here chronicled from his MS. notes) occupied five years and three months, from June 1864 to September 1869; and during his third, in command of the *Polaris*, he died suddenly in November 1871. The MS. of his several explorations was purchased by his Government and partly utilised in the preparation of the official narrative by Admiral Davis of the *Polaris* voyage; but the greater part is published for the first time in the present volume, which, prepared with the completeness, clearness, and elegance attending the recent official publications of scientific works by the United States authorities, and copiously illustrated, forms an invaluable contribution to the knowledge of the geography, ethnology, meteorology and physical conditions of the Arctic regions indicated by the title.

GENERAL.

Bevan, G. Phillips.—Primer of the Industrial Geography of Great Britain and Ireland. London (Sonnenschein & Allen): 1880, 16mo., pp. 109, price 1*s.*

The first of a series (intended to comprise some 15 vols.), of which the object is to explain the resources and industries of each country, together with the physical and geographical causes that have led to their existence.

Brown, Robert.—The Countries of the World: being a popular description of the various Continents, Islands, Rivers, Seas, and Peoples of the Globe. London (Cassell, Petter, & Galpin): 1879, sm. 4to, pp. 320, maps, pls., price 7*s.* 6*d.*

Includes Oceania, the Australasian group, Malay Archipelago, and Japan, and continues to combine descriptions of modern life with physical features and objects of ethnological and zoological interest.

Zeitschrift für wissenschaftliche Geographie, in Verbindung mit O. Delitsch (Leipzig), J. I. Egli (Zurich), Th. Fischer (Kiel), A. Kirchhoff (Halle a. d. S.), O. Krümmel (Göttingen), F. Marthe (Berlin), I. Rein (Marburg), S. Ruge (Dresden), Th. Schunke (Dresden), C. Sonklar von Innstatten (Innsbruck), A. Supan (Czernowitz), I. E. Wappäus (Göttingen), F. Wieser (Innsbruck), herausgegeben von J. I. Kettler (Lahr in Baden). Band I, Heft I. Lahr (Schauenburg): 1880, large 8vo., pp. 50, map. (*Dulau.*)

This new geographical journal, undertaken with so many learned assistants (the death of the chief of whom, Wappäus, is recorded in its very first issue), is to form an annual volume of 6 parts (price 6*s.*). Its scope is to be (1) Systematic geographical investigation and instruction; (2) Mathematical geography, theory of cartography; (3) Physical geography (including orography, hydrography, and oceanography, climatology and meteorology, and botanical and zoological geography); (4) Ethnology; culture and commercial geography; geographical aspects of historical events and developments (knowledge of countries, Ritter's comparative geography); (5) History of geography and cartography; ancient and mediæval topography. Each number is to contain original papers, criticisms, and notices, the latter consisting of accounts of the transactions of Geographical Societies, references to detailed reviews, and titles of new publications received.

This first number contains papers by Dr. R. Pietschmann on the Guanahani question (illustrated by a map showing the Bahamas at seven different epochs from 1500 to the present time); by A. Kohn on Severtzoff's Ferghana Expedition; and by the editor on the geographical position of Brunswick as a State; critical notices of Behm's Jahrbuch, Petrino's Treatise on the origin of Mountains, and the 'Cartas de Indias.' A long note by Dr. Otto Krümmel on mid-oceanic depths, some letters of Humboldt to Dr. Klöden, an analysis (by localities) of recent papers in German Geographical Societies' publications, and references to reviews, complete the part.

NEW MAPS.

(By J. Coles, *Map Curator* R.G.S.)

EUROPE.

Hauslab, F. Z. M.—Hypsometrische Uebersichts-Karte von Bosnien, der Herzogowina, Serbien und Montenegro. Scale 1 : 600,000 or 8·1 geographical miles to an inch. Wien, K. K. Staatsdruckerei. 4 sheets. Price 6*s.* (*Dulau.*)

Kiepert, H.—Wandkarte des Deutschen Reiches. Scale 1 : 750,000 or 10·3 geographical miles to an inch. D. Reimer, Berlin, 1880. 9 sheets. Price 10*s.* (*Dulau.*)

Schimpff, F.—Küstenkarte des Adriatischen Meeres. Blatt I–XVIII. Kupferst. Triest. F. Schimpff. Price 1*s.* 4*d.* (*Dulau.*)

Walseck, G.—Neueste Eisenbahn-Karte v. Deutschland u. den angrenzen
Ländern m. numerirten Bandvorrichtung. Lithogr. u. Col. 4 Blatt. n
Stationen-Verzeichniss, 8vo., Adelsdorff, Berlin, 1880. New edition, revised
date. Price 6*s*. (*Dulau.*)

Walterhausen, Bne. Sartorius di.—Carta topografica dell' Etna eseguita
Sicilia dal 1836 al 1843. Ridotta a piccola dimensione con l'aggiunta di t
le eruzioni posteriori al 1843 dal Prof. O. Silvestri nel 1879. Scale 1:250,00
3·4 geographical miles to an inch. Torino. Price 1*s*. 6*d*. (*Dulau.*)

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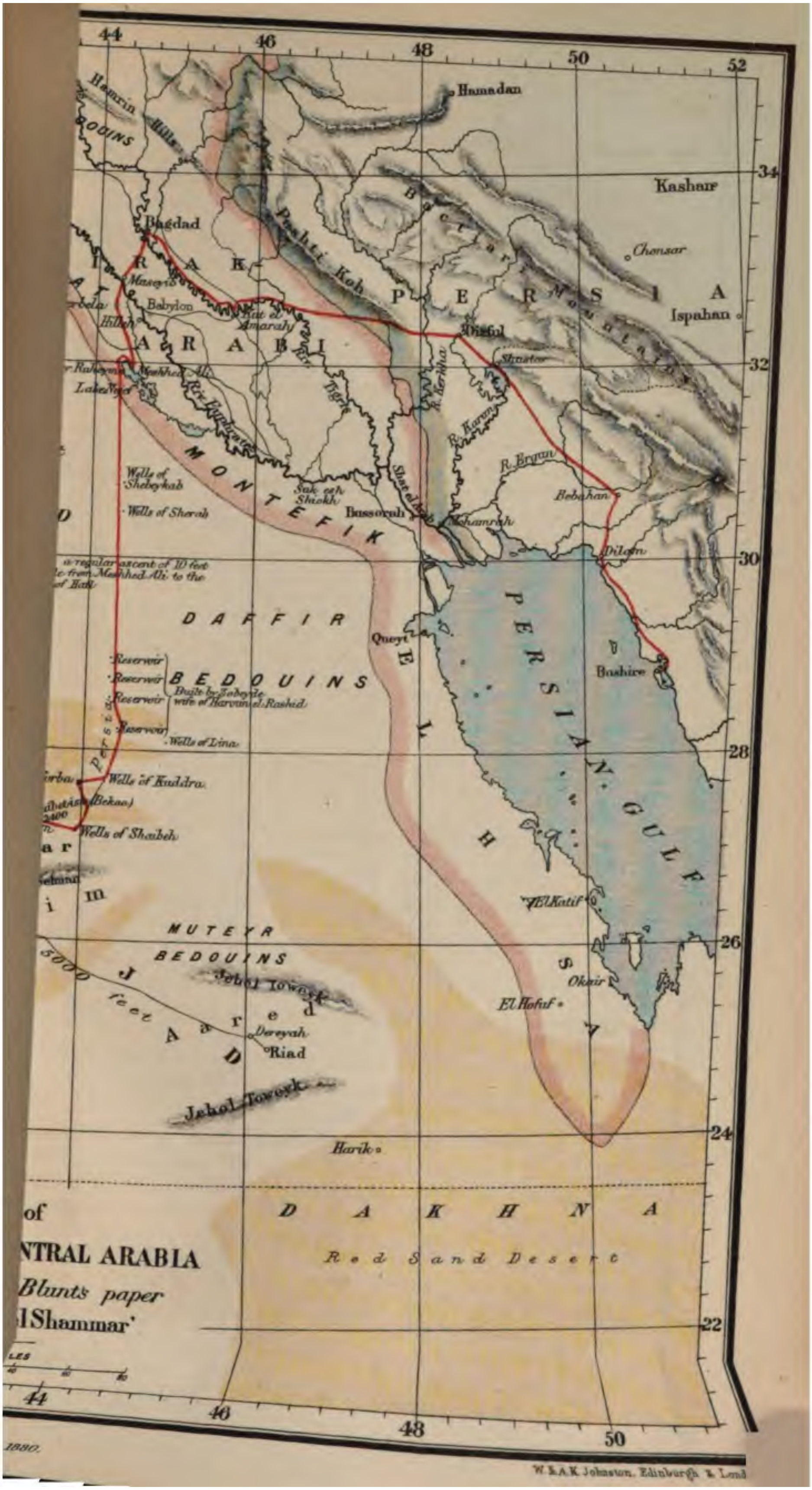

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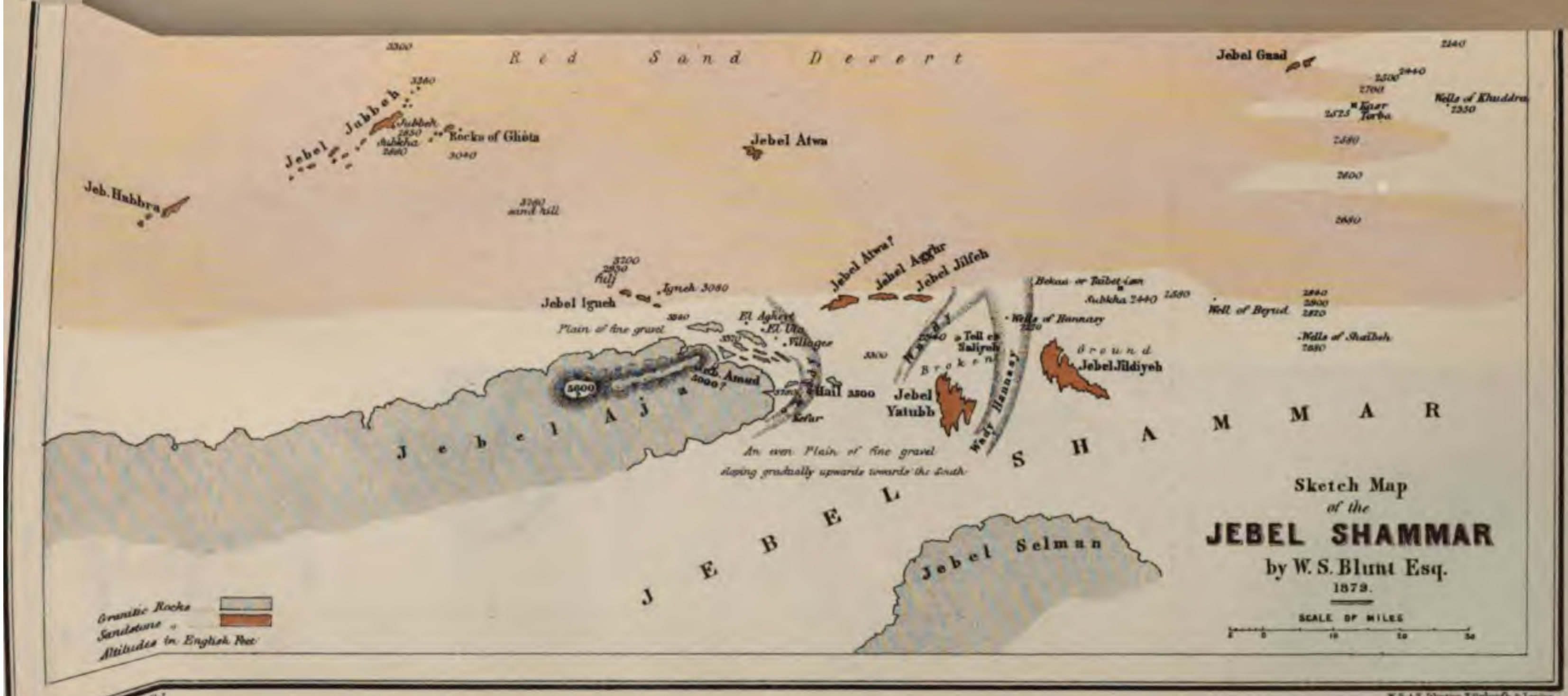

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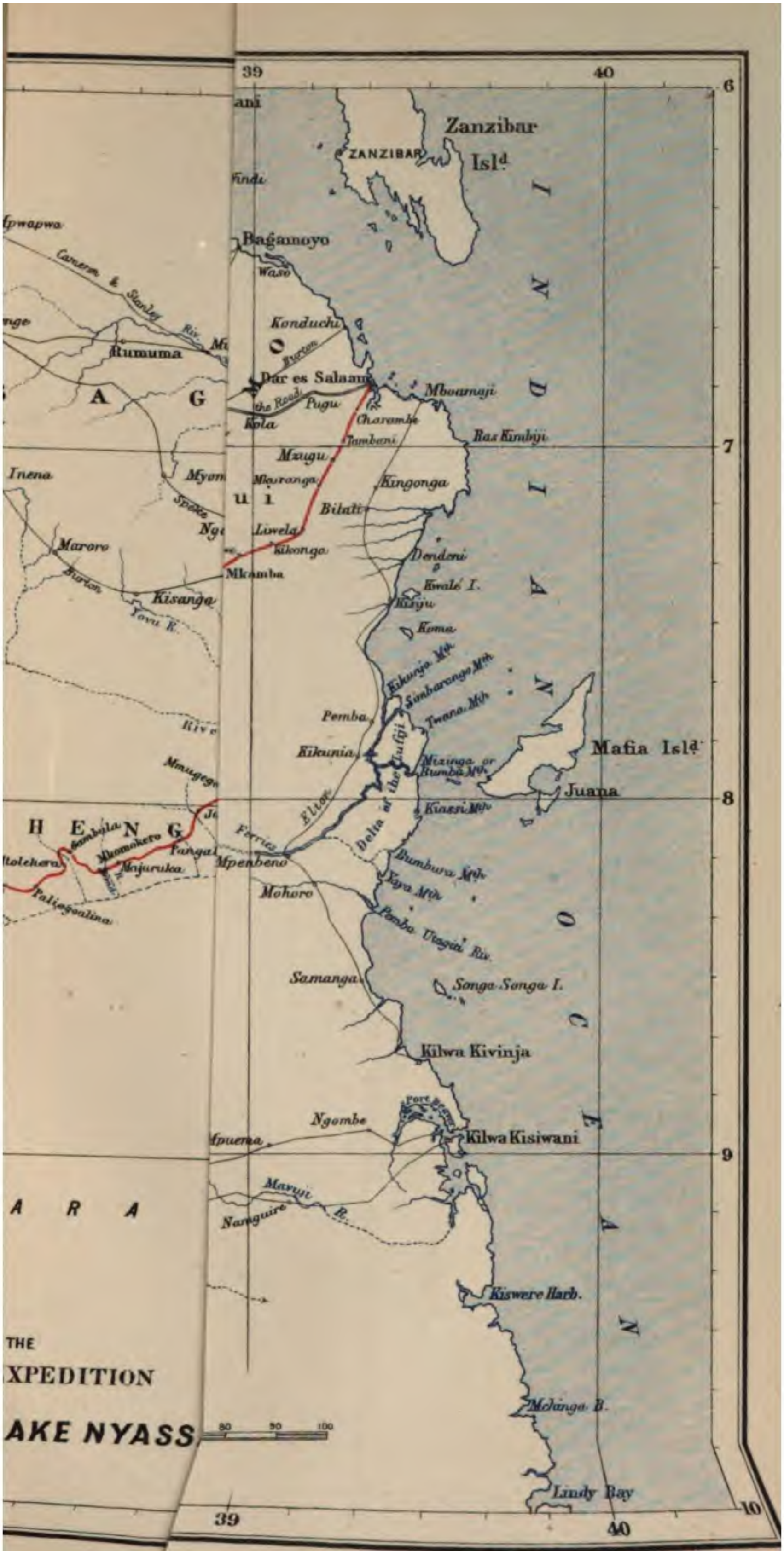

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PROCEEDINGS

OF THE

ROYAL GEOGRAPHICAL SOCIETY

AND MONTHLY RECORD OF GEOGRAPHY.

Journeys in the Interior of China. By G. James Morrison, C.E.

(Read at the Evening Meeting, January 12th, 1880.)

Map, p. 208.

1. *The Grand Canal and Yellow River.*—In the early part of 1878 I made two journeys in the interior of China; the first from Hankow to Canton, the second from Chin-kiang to Tientsin. The former of these journeys was interesting chiefly on account of the route traversing the rich mineral field of South Hunan. The second was interesting principally from the fact that I was enabled to examine a length of about 200 geographical miles of the Yellow River, including that portion between the point where it has broken from its old bed and the point where it has appropriated the channel of the Ta-tsing, a portion of the river which has altered very much since it was last described by any traveller. I was also able to make some observations on the state of the Grand Canal. During this journey, which I accomplished between the 23rd April and the 5th June, the weather was generally fine, and I was enabled to take several observations for latitude by which to check my dead reckoning. I took no observations for longitude.

The portion of the canal from Chin-kiang-fu to Ching-kiang-pu, a distance of 92 geographical miles, has perhaps some slight right to the title "grand." It is always navigable for boats carrying 50 or 60 tons, and often for larger boats. Steam launches, the property of the Chinese Government, drawing at least five feet, are constantly running on this portion of the canal. At some places it is as much as 100 yards wide, but at others, particularly near Kao-yu (chow), it is very narrow, not more than 50 or 60 feet when the water is low.

Almost all the way the level of the adjacent country is below the lowest water-level of the canal, and at intervals there are sluices through which water can be taken for irrigation when there is any to spare. In most places the embankments are in tolerable condition, but here and there they are gone, and immense areas of land are turned into lakes when the water in the canal rises.

At Ching-kiang-pu, the old bed of the Yellow River is reached. The part of the canal to the north of this is at a higher level than that to the south, and the passage of boats from the lower to the higher level is well-nigh impossible.

A couple of locks would make the matter easy, but the so-called locks of the Grand Canal are merely sluices or staunches. The canal is contracted to a width of about 23 feet, between masonry walls, which have grooves in them, to enable planks to be forced down so as to confine the water in the upper reaches. When boats have to pass, the planks are lifted, and the boats are drawn up against the current by means of ropes passed round capstans placed a little above the sluices. When water is scarce, the waste thus occasioned is at the root of all the troubles in the canal, and in some few places where water is plentiful, the rush is so great as to render the passage of boats impracticable. In one of these sluices near Ching-kiang-pu, at the time I passed the planks were up, and the water was rushing through at a rate much exceeding 10 miles per hour.

Just above Ching-kiang-pu there is a communication between the canal and a lake called Hung-Tsê, which is generally above the low-water level, and below the high-water level of the canal. It thus acts advantageously to the lower reaches, but the whole canal here is in such a bad state that almost everything is transhipped at Ching-kiang-pu, and either re-embarked at Yang-chia-chwang, or sent north overland.

The old bed of the Yellow River, which is crossed at this point, has been often described. The bed varies from half a mile to three miles in width, is generally ten feet or more above the surrounding country, and has banks on each side 10 to 15 feet high. Near Yang-chia-chwang the banks have been so much cut down and altered, that it takes some little time to understand them.

Above Yang-chia-chwang the character of the canal changes entirely. Within 10 miles of that point there are many places not three feet deep at ordinary water-level, and the depth gradually diminishes, until at Tai-erh-chwang, on the boundary between Kiangsu and Shantung, the depth is little over a foot, and at some points on the way it is even less.

When the Yellow River flowed in its old bed, the water-level of the canal was some 20 feet higher than at present, but now this part of the canal is nothing but an interesting relic of former days. Every here and there one sees large boats which have entered the canal during a period of high water, and are now lying rotting, having been detained for years for want of water to get out. All the boats are provided with wooden anchors, so that when they touch ground, the anchor may be taken ahead by men and stuck firmly into the bottom. The boat is then made to advance by passing the cable round a windlass on the forepart of the boat. I have seen boats dragged miles in this manner. At other times a fleet of grain boats may be seen attended by innumerable small boats, so that when a shoal is reached, the cargo may be discharged into these boats, and reloaded into the larger boats when deep water is gained. Beyond Tai-erh-chwang, the state of affairs when I passed was even worse. The sluices were all closed, and only opened occasionally, one at a time, when a fleet of boats was ready to go through, and for a long time previous to my visit only the smallest boats could pass. At Chi-ning (chow) I saw places where I could have jumped across the canal, but for the soft mud at the sides.

The summit of the Grand Canal is reached at about 25 miles before coming to the new bed of the Yellow River. As far as I could make out, there used to be a continuous fall from this point to Lin-tsing on the Yü-ho, a river which runs into the Pei-ho at Tientsin, and which forms part of the Yün-ho or Grand Canal. Now, however, the Yellow River has cut across the old line of canal at a place called Pa-li-miao, and as the bottom of the river is lower than the old canal bed, the portion of the canal between this point and the Yü-ho is dry whenever the water in the Yellow River is low. But although the canal is in such a bad state, it would be quite possible to repair it. In the first place, it would be necessary to take into account the effect which the change of the Yellow River has had upon it not only at the points of crossing, but all along its course. In the second place, the sluices should be replaced by locks, with proper provision for passing the flood water. In many places which I passed the water was running at the rate of two to three miles per hour, and in one place more than four miles per hour. With such a supply of water in the very driest season there would be no difficulty in constructing a navigable canal which would prove of the highest value. The Yellow River by abandoning its old bed has deprived the lower reaches of the canal south of the summit of a large supply of water, and has obliged them to draw more freely from the upper reaches, thus injuring them indirectly; while north of the summit it has cut across the canal at a low level, and so cut off the supply from many of the lower reaches, which can now only be supplied from the river itself, and that only when it is in flood.

In former days the canal was in a much better condition than at present. The difficulties and uncertainties of the coast trade in junks were infinitely greater than they now are by steamers; the inland water-way was consequently much resorted to, and the tradition of its former greatness as well as the force of habit among the people cause it to be still employed, but I am confident that if such a line of inland navigation were discovered in a new country it would be reported on as absolutely useless for all purposes of trade.

In travelling along the Grand Canal north of Ching-kiang-pu, one has ample opportunities of observing the old bed of the Yellow River.

All through Kiangsu it is now cultivated, and the crops when I saw them seemed better than outside. The bed is everywhere much higher than the surrounding country, in some places more than 20 feet. The embankments seem not to have been interfered with anywhere.

Further to the west, in Honan, viz. just below the point where the new course strikes off to the north-east, the old bed runs through a most desolate country. I passed during the time of the famine, when there had been no rain for three years, and the country was simply a sandy desert. I was caught in one sand-storm which lasted some hours, and was so thick as to make things quite invisible at a distance of 10 feet. Here, as well as along the unchanged portion of the river in Honan, there are numerous embankments ranged one behind the other, to protect the country from floods, and these are sometimes met with as much as 10 miles from the river.

I obtained my first sight of the Hwang-ho, or Yellow River, at Liu-yüan-kow, the port of Kai-fêng (fu), the capital of Honan. At this point the river when I saw it was about half a mile wide and about three feet deep, and running at the rate of about four miles per hour. This point is about 20 miles above Lung-mên-kow, the point where some twenty-eight years ago the river broke through its banks, and at some points on this 20 miles the river must have been nearly two miles wide, while the depth was so slight that although my boat drew only 18 inches it was often aground. At Lung-mên-kow great alterations are still going on, from the wearing away of the banks by the swift current. It is a most desolate-looking place, and during my visit was rendered more than usually hideous by the enormous number of dead bodies lying about.

For some little distance down the new course the river seems to have resisted all attempts to confine it within reasonable bounds. It has overflowed the low-lying country, and presents the appearance of a lake with numerous shoals and channels between. None of these when I passed had more than two feet of water throughout their entire length, though there were holes 20 feet deep; and this part of the river can hardly be said to be navigable. After about 25 miles, however, there is a change for the better. Embankments have been built along the banks on both sides. These, it is true, are built at such a distance that they can have no effect in training the low-water channel; still they protect the country from floods, they to some extent define the flood channel, and the effect they have produced is made quite clear by a comparison of the map which accompanies this paper with that presented to the Royal Geographical Society by Mr. Ney Elias.* Besides building embankments, the authorities have attempted to confine the river, or rather to protect the land, by planting trees. In this, however, they have been rather unsuccessful. The river has eaten away the banks, in some cases leaving the trees growing, in other cases carrying them off and depositing them in heaps elsewhere, in each case forming serious and dangerous obstructions in the river. At one point we passed through what appeared to be more like a flooded plantation than a river, and although the current of at least four miles per hour was with us, it took about two hours to go two miles.

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* Showing the state of the river in 1868. *Vide* 'Journal R. G. S.,' vol. xl. p. 1.

It is not to be wondered at that the Chinese have shrunk from grappling with the question of the regulation of the new course of the Yellow River, and have confined their attention to protecting the country. If, however, they choose to go thoroughly into the whole matter, there is little doubt that the river can be made navigable at all seasons for boats drawing three feet of water as far as Kai-fêng (fu).

The embankments are built entirely of silt, and their slopes are very steep. The large embankment on the eastern side is 20 to 25 feet high, and where it comes near the river, it is faced for short distances with fascines, but these in many cases consist only of millet stalks. Such embankments may protect the country for a considerable time from floods, but are absolutely useless when exposed to a rush of water. The best piece of work which I saw was at the point where, I believe, some years ago the river divided into two channels. The embankment here was certainly of a description calculated to withstand the effect of a swift current. The embankment on the west side is not more than half the height of the eastern embankment, and is of newer construction.

At a place called Sin-chia Ma-tow the Yellow River divides into two, joining again about 12 miles further down at a place called Shih-chiao, or Tung-kow (East Mouth). The western stream passes a place called Pa-li-miao (8 li temple), and from this point the Grand Canal runs north-west to Lin-tsing, on the Yü-ho. The eastern stream passes a place called Shih-li-pu (10 li village), at which point the Grand Canal from the south-east joins the river. There is now no passage through the island, but all boats must come round by Tung-kow.

From this point downward the river assumes quite a different character. It follows the course of a stream called the Ta-tsing (or Yen-ho), and a comparison between my survey * and that of Mr. Ney Elias, made in 1868, will show that comparatively little change is taking place; indeed, the two surveys agree as closely as could be expected, considering the swiftness of the current, and the consequent difficulty of estimating distances, particularly when travelling with the stream.

The swiftness of the current, the shallowness in some seasons, and the turbulence of the water in others, deprives the river of any right to hold high rank among navigable streams, still there is no doubt that with a very little trouble it could be made available for steamers drawing six feet as far up as the Grand Canal. Sailing boats must always find

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* The survey of the Ta-tsing here alluded to has not been received.—Ed.

it hard work to make way against a current of four to five miles per hour, still as one goes down stream the number one sees constantly increases; indeed, Lo-kow and some other villages may be called ports of considerable importance.

At Chi-ho or Tsi-ho (hien), about 61 geographical miles below the crossing of the Grand Canal, there exist the ruins of an old bridge across the river. The present Roman Catholic bishop at Tsi-nan (fu) tells me that he crossed the bridge once or twice after his arrival there in 1849, and he thinks it fell three or four years afterwards, when the full volume of the Yellow River first flowed along that course. Since then the bridge has been a terrible impediment to navigation. The only passage is between some of the stones near the west bank, and the river runs so swiftly that the passage down is attended with some danger of damage to the boat, and the passage up with very great difficulty.

Ruins may of course be seen anywhere, but ruins such as these, interfering for a quarter of a century with a large and important traffic, cannot, I am inclined to think, be seen out of China. Yet in China it is the rule, not the exception, and the same sort of thing may be seen in all parts of the country.

At Kai-fêng (fu) the roads, if I may be allowed to call them by that name, are of sand, and the sill of the principal gate is of stone, and stands up nearly a foot. I shall be underrating the inconvenience which this occasions, if I put down the loss of time at ten minutes per cart, not to say anything of the injury to animals, carts, and baggage. At Peking a similar thing may be seen. I twice entered that city with an interval of a year between. On each occasion the gateway was blocked by a cart stuck in the ruts in the pavement, which is here composed of enormous stones. The ruts were the same, indeed they looked as if they had been the work of centuries, and to all appearance the cart was the same, and likewise the string of vehicles waiting to pass, yet so far from this being a singular accident, I know that as a matter of fact the same thing must have happened many times on each of the 365 days of the year, in a place where the amount of traffic will bear comparison with some of the busy streets of London. I can never forget the feeling of despondency which came over me as, dirty and tired, I passed by the obstruction. The ruins of the bridge at Tsi-ho inspire the same feelings, and one cannot help wondering if it be worth while even to speculate on the possibility of advance in China.

But even in China changes do take place if one only waits long enough, and there is actually some faint chance of the ruins of the bridge being removed. There is at Lo-kow, the port of Tsi-nan (fu), an arsenal, and the manager of this expressed his intention of removing the obstruction to the river on the earliest opportunity.

This arsenal is interesting in its way. When its establishment was first proposed the authorities consulted Mr. Mesney, a gentleman who holds a high position in the Chinese army, but though he was able to give some advice at the moment, circumstances obliged him to proceed to another part of the empire; and it is a fact that from first to last the arsenal has been erected and worked by Chinese only, without any foreign assistance in any department. When I visited it, the engines, lathes, and planing machines, &c., were working very smoothly. Attached to the arsenal is a powder manufactory. They distil their own sulphur, and refine their own nitre, and though I had no means of judging of the quality of their powder, I thought it highly creditable to all concerned that they were turning out what was in appearance, and no doubt in reality, very fine gunpowder.

One point which makes this arsenal interesting from a geographical point of view, is the fact that all the heavy machinery was brought up the Yellow River. The mandarin in charge stated that on his arrival he found the mouth of the river in a very bad condition, that he executed certain works, the nature of which I did not clearly understand, but the effect of which was to increase the depth on the bar to ten feet at low water. Sea-going junks can come as far as Tieh-mên-kwan, and large boats, drawing probably seven or eight feet, can come as far as Tsi-ho.

One question which occurs to almost every traveller to the Yellow River is the advisability of making the river return to its old bed, or of retaining it in its new one. I have a great objection to discussing purely speculative questions, and this is undoubtedly one, still I feel constrained to say a few words on the subject.

In the first place, I have no doubt that the river is at present flowing along its natural course. Although I have used the word old bed, to signify the course of the river towards the Yellow Sea, it is well known that in former times the Yellow River discharged itself into the Gulf of Pei-chih-li. I crossed one very well defined old bed running in a north-easterly direction about eight miles east of Tê (chow) on the Tu-ho.

Although, therefore, works of some magnitude are required to retain the river in its present channel, particularly near the point where the recent rupture occurred, they are small in comparison with those required to maintain it in its late course to the eastward. On the other hand, it has been argued that all the embankments along the late channel are still in fair order, and if the river were restored to it, the water, being above the level of the country, *could* be used for the purposes of irrigation. The whole force of this argument depends upon whether or not we are entitled to substitute the word *would* for the word *could*. That the Grand Canal would benefit in certain ways is unquestionable, but it could be much better dealt with in other ways;

but that the water of the Yellow River would be used to any great extent for irrigation appears to me highly improbable.

Judging from appearances the river seems to have been considered anything but a friend in former times, and there is in my opinion no question that if the Yellow River were restored to its former bed the care of the people would be directed towards protecting their land against its floods more than towards availing themselves of its water in case of drought. I therefore consider that it is better that the river should retain its present course than that it should be turned back to its late bed.

There is still a third course open, viz. that of constructing an irrigation canal along the late bed of the river and supplying that canal with water from the river through proper works at Lung-mên-kow. I am not surprised that the magnitude of the necessary works has been considered an obstacle to this course, but gigantic as they would be I believe they would be really less costly to the nation than the protecting works required along the several hundred miles from Lung-mên-kow to the Yellow Sea.

A canal along the late bed carrying an amount of water sufficient for irrigation, but not so large as to be unmanageable, would be a real boon to enormous tracts of sandy country. I feel, however, that the time has not come when a discussion of this question can lead to any practical result and I shall therefore not enlarge on it further.

There is one other point which is of great importance, and it was indeed with a view to its solution that I undertook the journey. It is the question of crossing the river by a railway.

Peking, the capital of the Empire, although in the latitude of 40°, suffers from very severe winters, and the Pei-ho is completely closed by ice for at least two months every year. It is clearly of the highest importance that Peking should be connected by a railway with some port open all the year round, and no such port can be found without crossing the Yellow River.

From the well-known character of the river, it is clear that neither its width nor depth offers any obstacle, and though its bottom is of shifting materials, I have reason to believe, from the inquiries I made, that it is very unusual for holes deeper than, say 20 feet, to be made by floods. The only difficulty, therefore, is the liability to change, and when it is remembered that the Grand Canal (the line of which has been suggested as a possible railway route) is now crossed by the river some 200 miles from the point where it was crossed less than thirty years ago, it will be admitted that the question is an important one. So large and important is it that I am unwilling to put any definite statements regarding it on record, not from any wish to keep back information, but from the conviction that I have not as yet been able to study the matter sufficiently.

I may, however, say this, that between Yu-shan and Lo-kow there are many points where the existence of small rocky hills and the general configuration of the country justify one in making the statement, that so long as the river adheres in a general way to its present course, there is no fear of its channel altering materially at these particular points. It would, therefore, be practicable to construct a railway from Peking, either towards Chin-kiang or Chefu, without running any great risk of destruction from any ordinary changes in the bed of the Yellow River.

In the case of a line from Peking to Hankow, and thence to Canton, the river would have to be crossed near Kai-fêng (fu), and here the course of the river is of that uncertain and shifting character so very troublesome to deal with. I believe, however, that somewhat further to the west more practicable crossing places are to be found, and I hope at some future time to be able to give some more definite information regarding them.

2. *Hankow to Canton Overland.*—I am not sanguine enough to believe that within a few years China will be covered with a network of railways, still I am unwilling to miss any opportunity of making myself acquainted with the districts through which main lines will have to be constructed if the country is ever opened up. With this object in view, I lately travelled from Hankow to Canton.

I had intended to walk the whole distance, but the rudeness of the people in Hunan made me alter my plan, and the following is an abstract of my itinerary, extending over forty-two days, from the 18th January to 1st March (1878):—

	English Statute Miles.
Hankow to Siang-yin on foot, viâ Hien-ning, Pu-ki, and Yo-chow	229
Siang-yin to Lei-yang, by boat, viâ Chang-sha, Siang-tan, and Hêng-chow	234
Lei-yang to Ping-shih, on foot, viâ Yung-hing, Chên (chow), and I-chang..	105
Ping-shih to Canton, by boat, viâ Lo-chang, Shao-chow, and Tsing-yüan ..	292
	860

The distance in a straight line is about 525 miles, and I estimate that an ordinary overland route would be less than 700 miles.

The recognised route for travellers is by boat on the Yangtsze to Yo-chow, thence by boat through the Tong-ting Lake and up the river past Siang-yin, Chang-sha, Lei-yang, &c., to Chên-chow, the last 20 miles being performed in small boats. From Chên-chow to I-chang, a distance of about 30 miles, travellers must go by land over the pass called the Che-ling. From I-chang passengers go in small boats to Lo-chang and thence in large passenger boats to Canton, the entire overland journey, with the exception of 30 miles, being thus accomplished by water.

After the first 229 miles, my route was practically the same as that followed by Dr. Dickson and Mr. Thorburn, and by Baron Richthofen. The letter of the latter on Hunan, addressed to the Chamber of Commerce, proved most useful to me, and I found the information given to be generally very correct. Here and there, as might be expected, one finds a few inaccuracies, and if I allude to these it is simply with the view of giving new information, and with no wish to detract from the value of his most able communication.

As I started with the intention of walking, I cut down the weight of my baggage to the lowest possible limit. Besides a few clothes, I carried some biscuits and a small quantity of spirits; but I trusted to the country for my ordinary supplies, taking only a few tinned meats to be used in case of accident.

Accompanied by a trustworthy Chinaman as interpreter, and a coolie from Shanghai, and provided with an ordinary passport, I started from Hankow on the morning of the 18th January. Crossing to Wu-chang, I struck south, and after walking 17 miles arrived at the resting-place for the night. The cold was intense, and we started next morning with baggage, which had lain in our room all night, still covered with snow.

We adhered to the same style of travelling for eleven days, during which we accomplished 229 miles. Some of the places at which we stopped were wretched in the extreme. At one place I could get no fowls, no eggs, no firewood, and no charcoal. The natives used rice husks to boil their rice, and drank an infusion of beans instead of tea. At this place I had to buy a stool and break it up to make a little fire at which I might warm my hands sufficiently to enable me to write my diary; but the result was most unsatisfactory, as the stool had been covered with some sort of oil or varnish, the burning of which made my eyes smart so that I could not see. The only way of having a fire in these inns is to buy some wood, and make a fire on the mud floor. The smoke eventually finds its way out through the numerous holes in the roof and walls, but as it fills the room first, it is very trying if the wood is damp.

The people in South Hupeh were very civil and not very inquisitive, but as I got into Hunan I remarked a great difference. Great part of my land journey was through a district which had not been visited by a foreigner within the memory of the oldest inhabitant, and all the natives were most anxious to have a look at me. My approach was always proclaimed by some one who managed to get ahead, and at each village there was a crowd waiting to see me pass. One expects this sort of thing, and soon comes to look upon it as a matter of course; but occasionally matters assumed a more serious complexion. At Yo-chow we were mobbed by a crowd of roughs, and were glad to get out of the place unhurt. The next day I was attacked by a similar mob at a town called Sin-chiang, and was a good deal knocked about. The day after we had a small stand-up fight with four men, but luckily the only casualty was the loss of a small piece of my interpreter's tail. At the next town I visited, named Kwei-yi, the eagerness of the crowd to see me was most trying. I managed to get into an inn, but the people collected outside, forced an entrance, broke my room door off its hinges, though we had barricaded it as well as we could, and I was compelled from about seven o'clock till ten to go out and exhibit myself.

On arriving outside Siang-yin on the 28th January, I sent on to the mandarin to ask for an escort, and it is well I did so, for without the servants and soldiers whom he sent, I think I should have been torn to pieces by the crowd, which contained a goodly sprinkling of roughs, though the majority were only anxious to see me.

I found that the regular land route south from Siang-yin was part of the way on one side of the river and part of the way on the other side, and this fact made me less unwilling than I should otherwise have been to abandon land travelling for a time and take to boats. I accordingly hired a boat, and after one day's detention on account of bad weather, I started up the river for Chang-sha.

The boats on the Siang River are cheap but very uncomfortable, and offer very poor protection against the weather; still, on the whole one can live better on board a boat than at the village inns.

The boating population seemed good-natured, but very ignorant on subjects where one would have expected to find a certain amount of knowledge. The vagueness of their idea on the subject of distance was most amusing, when not irritating. One of the boatmen told me that the mountain called Hêng-shan, about 40 miles south of Siang-tan, measured 30 *li* from the bottom to the top, and 15 *li* from the top to the bottom, and he was supported in this statement by a number of other boatmen to whom I applied for the same information. On another occasion, I was told that the distance between two places was 30 *li* by river and 15 *li* by road, and I found out afterwards that the road followed the bank of the river the whole way; but the river was full of rapids, which perhaps counted extra.*

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* "It is nearly impossible to obtain any even approximately exact idea of distance in these regions from the Chinese. We heard, for instance, with incredulous ears, that the distance between two places depended upon which end one started from. An explanation of this difficulty offered by an intelligent native was this: carriage is paid on a basis of so many cash per mile. It is evident that a coolie ought to be paid at a higher rate if the road is up hill. Now it would be very troublesome to adjust a scale of wages rising with the gradients of the road. It is much more convenient for all parties to assume that the road in difficult or precipitous places is longer. But I protested that on the same principle wet weather must elongate the road, and it must be further by night than by day. Very true, but a little extra payment adjusts that. The scale of distances is something like this: on level ground, 1 statute mile is called 2 li; on ordinary hill roads not very steep, 1 mile is called 5 li; on very steep roads, 1 mile is called 15 li." —E. C. BABER.

At Lei-yang I resumed my original style of land travelling as far as Yung-hing. Here, being anxious to examine the country more minutely, I spent three days doing 15 miles, and during this time I had a boat for my head-quarters, but after that I again reverted to the plan of sleeping in the villages, and walked on to Chên (a city of the second rank, always called Chên-chow), situated on the head-waters of an affluent of the Lei or Lei-yang River. From this point to I-chang, a distance of about 30 miles, the route lies over the watershed which divides the basin of the affluents of the Yangtsze from the basin of the rivers of Kwangtung. The name of the pass here is the Che-ling, and the height of the summit is certainly less than 1200 feet * above the sea, but the weather was so execrable when I was there that no readings of an aneroid could be relied on as being accurate. The pass between Kiangse and Kwangtung is called the Mei-ling, and many foreigners talk of the pass between Hunan and Kwangtung as the Mei-ling or Little Mei-ling, but it is not known by that name among the natives. The Chinese do not seem to give names to rivers, mountains, or passes, as we do. Most of the more important have local designations, but few have names which are known beyond a limited area. While on their maps not only every city but numberless insignificant villages are inserted, the greatest care being taken to indicate the exact rank of each, the great physical characteristics of the country are unnoticed. The Mei-ling Custom-house is marked on the map, but no reference is made to the Mei-ling or Che-ling as important mountain passes. The Chinese maps of this district are very incorrect, and some foreign maps are worse. The best I have seen is Keith Johnston's. The fact that along the north of Kwangtung there is a range of mountains, but that this range does not form the watershed, has been puzzling to geographers. I-chang, which is on the south side of Che-ling Pass, is still in Hunan, and is situated on the head-waters of an affluent of the North River of Kwangtung.† This affluent runs in a narrow gorge through the range above referred to, and joins the north river at Shao-chow.

The observations which I made on my journey have enabled me to

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* Richthofen says probably less than 1000 feet [Capt. W. Gill].

† "The fact that the prominent range of Tung-lo-ling (a portion of the Nan-ling ranges) does not form the watershed between Kwangtung and Honan, but is intersected by a navigable river having its sources north of it, is an important circumstance in the history of Chinese commerce in the empire. Hopes have been entertained that this same route would be practicable for a future railroad to connect Canton with the coal-fields of Hunan, but the prospects for such an enterprise are dim. The precipitous gorges in which the north river (the Canton River) breaks through the three ranges, are a formidable obstacle, and unless another and a better route is found, which is far from probable, the prospective profits of an easy connection with Hunan must be enormous in order to justify the great expense of laying a railroad track along the north river and Wu-shin."—RICHTHOFEN.

make what I believe to be a more correct map of the route than any yet published, but all connected with China must look forward with interest to the appearance of the Atlas of Chinese Maps, which Baron Richthofen, in the preface to his new work, states he will be able to publish shortly. The want of a good or even a tolerable map of China is much felt by anyone who travels.

The journey over the pass is performed in two days, in a way that will I think compare favourably with any land journey in China. Though the glory has departed from this route, as it has from the old post roads in England, still there are the remains of what for China may be called fair hotels, and the people even now are accustomed to occasional visits from mandarins and large merchants.

The change in the manners and customs of the people in passing from Hunan to Kwangtung was most remarkable. Even at Ping Shih, though only a few miles from I-chang, the shops and the dresses of the men and women were decidedly southern in character, while at Lo-chang, the most northern city on this route in Kwangtung, all the women have large feet and work hard in the boats, many of them carrying their babies on their backs, and a large proportion wear the brown cotton dress so common in Canton. In Hunan all the women have small feet, they never carry their children on the back; and do little work except in connection with household duties.

At Ping-shih I took boat for Lo-chang. In the mountain gorge above referred to, and which lies between these two places, there are numerous rapids on the river. The boats used are rather small, and before coming to the first rapid they are bound round with ropes, a proceeding which appears to be highly necessary, as the boats are very light and twist about so, that unless some such precaution were taken they would be very likely to resolve themselves into a number of planks.

In ascending the river, the boats come in fleets, and when a rapid is reached all the men join together and track up one boat at a time. The difficulty varies much at different seasons, and indeed from day to day, according to the state of the river; but when I passed, the pulling up of the boats seemed to be most trying work. It was no uncommon thing to see twenty or thirty men tracking up a small boat, and often having to wade in the river round projecting rocks where there was no path on the shore; and the numerous wrecks lying on the banks bore evidence to the great destruction of property continually going on, though I fancy lives are seldom sacrificed.

At Lo-chang, I was able to engage a large if not very comfortable boat. The regular passenger boats are tolerably well fitted up, but they gain such large sums by taking passengers at so much a head, that I could not engage one for myself, except at a price which was prohibitory. In the neighbourhood of Canton, boats are kept for letting out to private individuals at moderate rates, but the demand for such boats at Lo-chang is too small to induce any to remain there.

Before starting from Hankow I had spoken of my journey occupying probably six weeks, and having started at 10 A.M. on the 18th January, and finding myself on the evening of the 28th February at Fatshan, within less than 15 miles of my destination, I was anxious to arrive by 10 o'clock the next forenoon; but although we had everything ready, and started in the morning as soon as I could see my compass, we did not reach Sha-mien till 11.30.

The country through which I passed presented many points of interest. Near Wu-chang, the land is low and subject to floods, but a short distance to the south it becomes undulating and is well cultivated. Rice, wheat, cotton, and a little tobacco are the principal products. A little to the west of Pu-ki, I came upon the borders of the tea districts. Here, as well as elsewhere in Hunan, a good deal of tea oil is made. The plants from which the seeds are obtained are grown about eight or nine feet high, and are more straggling than the tea shrubs. The leaves of this tree cannot be used for making tea. The tree has been named the *Camellia oleifera*, but in Simmonds' work on 'Tropical Agriculture' it is stated that tea oil is obtained from the seeds of the *Thea viridis*, and in many parts of Hunan the natives asserted that the plant was the same as the tea plant, but cultivated differently. If the species are distinct, they are very closely allied.

The country between Yo-chow and Siang-yin is not so fertile or so well cultivated as that between Pu-ki and Yo-chow. Round Siang-yin there is a good deal of flat country, and there, as elsewhere through Hunan, wherever there is suitable country, rice and similar crops are grown.

The Siang River in some places is nearly a mile wide, but the usual width when the water is low is about one-third of a mile. Large cargo-boats, drawing five feet and upwards, go as far as Chang-sha, but only in certain seasons; and the river is evidently not suited for any steamers except light paddle-boats. I do not think a steamer drawing more than three feet could run *regularly* as far as Siang-tan, though one drawing five feet could probably get there if allowed to take its own time. Above Siang-tan there are some very shallow places where the stream runs very fast. These would probably be insuperable difficulties in the way of steamboat traffic.

Chang-sha, the capital city of Hunan, is a large and apparently prosperous place. The shops are good, and there must be a large river trade, judging from the great number of boats lying in front. It is a great depôt for poles from the interior, of the description known in Shanghai as Hankow poles. I cannot believe that the population amounts to a million, as generally reported. It certainly contains far fewer people than Glasgow or Liverpool. Probably 300,000 is a liberal estimate. The town is some three miles long, and the whole of the river frontage is lined with boats, this being a less exposed place than Chang-sha.

The Lei, or Lei-yang River, flows into the Siang River a mile and a half below Hêng-chow, which city is situated about 105 miles above Siang-tan. The river is very swift, and winds so much that distances measured along it are double the distance as the crow flies. Some of the rapids present great difficulties to the passage of boats up the stream. The river is principally remarkable for its coal trade, to which I shall refer further on. All the flat country in the neighbourhood is cultivated, but most of the hills are barren. Above Lei-yang the country becomes very hilly, and above Yung-hing the river passes for miles between perpendicular cliffs, giving rise to some pieces of fine scenery. A great deal of tea oil is made in this part of the province. The tobacco grown between Lei-yang and Chên-chow is said to be of good quality, and is exported to Kwangtung.

The country near the watershed is bleak and uninteresting. The road over the Me-ling Pass, which is by no means steep, is crowded with traffic—tea oil, tobacco, &c., going south, and salt and Canton goods going north. The salt and other heavy goods are generally carried by pack mules, while the lighter goods are carried by coolies. The regular rate is 600 *cash* per picul for the 30 miles. At the time I passed, a great deal of rice was being carried south to supply the deficiency in Kwangtung, but this is unusual. The deficiency was caused by the destruction of the crops on the low lands by floods. The distress caused by this was very severe, and numerous people were obtaining relief at Ying-tê, Tsing-yüan, and other places; but as far as I could hear, there was no such wide-spread distress as to be beyond the power of the mandarins to deal with.

The absence of trees is very noticeable, both in Hunan and Kwangtung, but especially in the northern part of the last-named province. For miles one may see hills denuded of every tree, and looking barren and cheerless. In Hunan some attempts are being made at replanting, and the hills do not present such a dreary appearance.

The North River of Kwangtung is a much deeper and more important stream than the Siang River. The river between Lo-chang and Shao-chow has some shallows, which would be impediments to steam navigation; but from Shao-chow, south, the only troubles would be the freshets, which cause the water to rise quickly and the river to run swiftly; but as far as I could learn there is nothing to prevent regular steamboat traffic being carried on as far as Shao-chow.

The part of my journey which interested and astonished me most, was the examination of the coal-fields of Hunan and Kwangtung.

To the west of Siang-tan, bituminous coal of not very good quality is found, and the city is a centre of distribution for the coal which comes from the west, and for that which comes down the river from the south. Soon after passing Siang-tan, the northern limit of the Siang River coal-field is reached. The field produces a semi-bituminous coal of extremely poor quality, and indeed the only fair coal which I saw on this portion of the river was anthracite, brought down a small tributary from Cha-ling, a district to the east, situated about the northern boundary of the anthracite field. As one advances up the river, one loses sight of the ordinary cargo-boats seen below Siang-tan, and one is struck with the large number of boats coming down stream, laden with coal, and the large number going up empty; but one does not fully appreciate the extent of the trade until reaching the mouth of the Lei-yang River. When I passed this point, there was a fleet of large boats waiting to be loaded with coal brought down the Lei-yang River in smaller boats. Judging from the number and tonnage of boats which I met coming down the river, laden with coal, I estimate that about half-a million of tons per annum must be exported in this way. Richthofen says that when he passed, 150,000 tons per annum was probably a low estimate, but he states that when he visited this place the boats took general cargoes up the river and about two-thirds brought down coal. When I passed (exactly in the same season), an insignificant proportion of boats took cargo up stream, an immense number going up empty; and as I have no reason to suppose that the general trade has diminished, I conclude that the coal trade has much increased, and that my estimate is not excessive, although I am fully alive to the fact that it is somewhat rash to jump at an estimate of the year's output from the observations of a few days. A small proportion only of this coal is for foreign consumption.

I visited a great number of mines, and obtained specimens of the coal extracted, and I also obtained numerous specimens from the various shipping places on the river. Some of the anthracite from the Lei-yang district is of excellent quality, but much of it is very soft. Some very good mines are situated on what is known as the Fei-kiang, a small creek a few miles south of Lei-yang. The Chinese generally have two or three mines close together (I have seen as many as ten), and they often speak of this as one mine. The cluster of mines on the Fei-kiang is said to give employment to 1000 men.

One of the principal coal shipping places is Tsing-shui-pu, a village about half-way between Lei-yang and Yung-hing. This village measures about three miles along the river, and the greater part of the frontage is occupied by coal wharves, to which the coal is carried from a number of mines within a radius of three miles. These mines are said to employ 2000 men.

The whole of the coal found near the river between Lei-yang and Yung-hing is anthracite. The seams are said to vary from two to six feet in thickness, but the pit wood, of which one sees numerous stacks all over the country, is cut to a standard length of about five feet, from which I conclude that most of the seams worked are about that thickness.

A little way to the south of Tsing-shui-pu there are two ironworks. The ore used is brown hæmatite, evidently picked off the surface. One of the blast furnaces was about 25 feet high. The iron is smelted entirely with charcoal. The business is said to be a bad one, as the iron will not fetch a remunerative price. At one of the works there was a stock of about 30 tons of pig iron, and a considerable quantity of wrought iron. Baron Richthofen leads one to suppose that the ore which is smelted in this district comes from Chên-chow. This is a mistake. It is all found in the immediate neighbourhood. The ore near Chên-chow, which one sees lying about all over the country, is smelted near Chên-chow with charcoal.

About 20 miles to the south of Yung-hing, excellent bituminous coal is found, and finds a ready sale at a high price. It contains a considerable amount of volatile matter, and appears to be suited for making coke. This coal-field is right in the centre of the district described by Baron Richthofen as producing nothing but anthracite. It appears to be of no great size, but is certainly notable as producing the best coal of that class which I have seen in Hunan. All the coal which I saw in the neighbourhood of Chên-chow and I-chang was anthracite. It is all used locally. Near Ping-shih, just on the borders of Hunan and Kwangtung, some excellent bituminous coal is found, which is shipped down the river towards Canton.

The coal-field of the north of Kwangtung produces, as a rule, very inferior bituminous coal. To the north-east of Shao-chow there is a little coal of apparently very good quality. Some inferior coal is worked in the same district, and as it all comes to the east gate of Shao-chow to be loaded into the river boats, it is difficult to identify it down the river. The native traders, however, know it well.

There appeared to be a great objection on the part of the natives to allow me to visit the interior of their mines. The miners were very civil, as indeed all the people were who were engaged in work, only the idlers being troublesome; and they were quite willing that I should go to the outside of the mine and see the coal brought out, gave me specimens, and willingly told me the price, though I fear they occasionally romanced as regards this last point, knowing well that there was little chance of business; but requests to visit the workings, when not treated as jokes, were met with distinct refusals; and I began to fear that I should fail to see any during my whole journey.

At last, however, I got permission to visit one mine during the time the coal carriers were having their afternoon meal. The seam was about six feet thick, lying at an angle of about 1 in 4. As in all other cases I have *seen* in China, the entrance was at the outcrop of the seam on the side of a hill. The work was being carried on according to the system known as pillar and stall, and though the pillars were rather small, the work was not being carried on badly. The workings were regular, and the roof was kept quite safe. There was very little water, and indeed the Chinese would be utterly unable to cope with large quantities; but they evade the difficulty by only working in places where water does not give trouble. Their great fault is that below ground as above ground they have no roads. In all the mines I have seen, the coal is drawn or carried out by men or boys in sledges or baskets, about one picul at a time. The consequence is that about 20 tons per day must be the extreme limit of the output of any one mine. This want of roads is noticeable in the mines all over China. I last year visited one mine near Peking, where the working faces must have been at least 1500 yards from the entrance. In this case the road was so bad that it took me about three hours to go to the face and come out again, and the total output was about four tons per day, while if it had been properly worked it might have been 400.

Captain W. Gill, R.E., read the foregoing paper, in the absence of the author. The following discussion afterwards took place:—

Mr. J. Dixon, C.E., explained that Mr. Morrison had been sent to China for the purpose of exploring different parts of the empire, with a view to the future development of the traffic communications, and the paper which had been read was the record of the observations he had made with this object. Geographical exploration was always followed by a desire to turn the knowledge obtained to a useful and practical purpose. Nearly one-fourth of the human race were confined in a country which at present was almost utterly devoid of all those means of communication, which in most civilised countries were regarded as absolute necessities. Mr. Morrison was selected to construct the first railway in China, and all his explorations were made with the hope that at some not far distant day the whole of that vast country would be opened to the commerce of England, and consume our iron and other materials to an enormous extent. China, it must be remembered, was an old country, and it was a very slow process to remove prejudices there. It took a considerable time to convince Chinamen of the advantages of improving their means of communication. If they would not adopt railways they might be persuaded to improve their canals, and as they recognised the facilities thus afforded for distributing food, and for all the purposes of commerce, it might be hoped that the day was not far distant when the hope expressed by the late Chinese Ambassador a year ago would be realised,—that he might live to see the day when a railway from Tien-tsin to Peking would be an accomplished fact. Though the first railway had had such an unfortunate end, it carried half a million of passengers with perfect safety and success, and one-half of the trains during the eighteen months that the line was in use started before their time, because the rush of passengers was so great that the carriages were filled and it was of no use waiting. In the initiation of that line, their distinguished Chairman took no small part, and although the jealousies of the mandarins resulted in its being pulled up, yet it had made its mark, and the efforts of those who were connected with it would prove in the long run not to have been misplaced.

Dr. Lockhart said all those who had lived in China for any length of time must have heard a great deal about the Yellow River, and the damage done to the Grand Canal, by which so much food was formerly conveyed to the northern districts. It was a pity that so splendid a waterway should thus be lost to commerce, and that European engineers were not employed to carry out a system of sluices, which would save the water. He had seen the Yellow River at different parts of its course, and knew what destruction it had caused to the surrounding country. The Chairman knew very well what was the result of the breaking through of the Yellow River at Kai-fêng-fu, and the transposition of its mouth to a spot some 200 miles farther north. The only other instance on record of so large a river changing its bed to such an extent was that of the Oxus, which formerly flowed into the Caspian, but now into the Aral Sea. The destruction of bridges, the inundation of the country, and the ruin of great tracts of land, were exceedingly lamentable, and the Chinese Government ought at once to institute such measures as would enable them to bank up the Yellow River again, and cause the flow of water once more through the Grand Canal.

Mr. Wylie said he had known Mr. Morrison from the time of that gentleman's arrival in China, and was acquainted with the satisfactory manner in which he had completed the Wu-sung Railway. That line was largely taken advantage of by the Chinese. Things moved slowly in China, but he believed that they moved surely. A long time was needed to convince a Chinaman of the advantage and practicability of any new project, but in due time this result would be brought about. He had no doubt that ultimately railways, and many other of the improvements of Western lands, would be introduced into China. While the Wu-sung Railway was open, the people were very fond of using it, and came from the most distant parts of the country for the purpose of having a ride upon it. He hoped the time was coming when Mr. Morrison would be largely employed in constructing other railways there. To say nothing of some half-a-dozen arsenals, the Chinese had established a number of European schools. They had engaged scientific gentlemen from the West in various departments. Scientific works were also being translated on an extensive scale; and everything seemed to point to a vast movement in the future. With regard to the Yellow River, he (Mr. Wylie) had crossed the dry bed before the diversion of its course was generally known in Europe; in fact, some years after this event, Lord Elgin came to China with instructions to station a man-of-war at the mouth of the Yellow River, to prevent vessels coming out of what was then the dry bed. He also remembered passing, nearly twenty years ago, the broken bridge which Mr. Morrison had referred to. It was utterly impassable as a bridge, and the canal was almost choked up as a waterway. He could bear testimony, from personal experience, to the wretched state of the roads in China. On one occasion the road was so bad that his carter, in preference to proceeding by it, diverged into the fields, at the cost of passing over stone walls nearly 18 inches high. A friend sitting beside him, Mr. Hollingworth, knew more about the new course of the Yellow River than he did, he having accompanied Mr. Ney Elias on his scientific and exploratory expedition—an expedition which elicited so much praise from the late Sir Roderick Murchison.

Mr. Hollingworth said that from the description given in Mr. Morrison's paper it appeared that the Yellow River was pretty nearly in the same state as it was when Mr. Ney Elias and himself visited it in 1868. That river only affected one portion of the Grand Canal. From the summit level to the southern extremity, the canal could be supplied at present almost as well as it ever was. At the summit level the water runs in two directions, one portion going to the south and the other to the north, and it still ran to the south.

The CHAIRMAN (Sir Rutherford Alcock) said the Meeting had listened to statements of considerable interest connected with the physical geography of part of China. The erratic tendencies of the Yellow River were a source of great trouble and anxiety to the whole population of 170 millions inhabiting the central plain of China, and indeed it was popularly called "China's Sorrow." It was a magnificent volume of water, rising in the mountains from a variety of small springs and lakelets. Like the African Lualaba, the Yellow River rose in a lacustrine region. It was not more than 1200 miles from the mouth to the source in a direct line, but its course was so circuitous that its length was between 2500 and 2600 miles. From the earliest times it had been so exceeding wayward that it had always been rather a source of danger than of wealth. Since the year 600 B.C. to the present day there were no less than nine instances on record of its change of course. It had changed its mouth from north to south over an area of some four degrees of latitude, and each time emptied its vast volume of water in different directions, sweeping over a populous plain. In order to obtain a proper idea of the physical geography of the region, it was necessary to adopt Lord Salisbury's advice, and take a very large map, because the great eastern plain of China which was drained by the Yang-tsze-kiang and the Yellow River, occupied over 720,000 square miles, and according to the last census, which there was no reason to distrust the accuracy of, because all Asiatics had a great dread of the poll-tax, and would be more likely to diminish than to increase the number, the population was upwards of 170 millions. The property and life of these people had been at the mercy of this most capricious and disorderly of rivers, and when Lord Macartney's Embassy crossed the river and passed along the Grand Canal both watercourses were regarded with fear by the people, because the canal between the Yellow River and Yang-tsze, a distance of some 90 miles, is carried on a mound of earth 20 feet above the level of the plain, which was covered with towns and villages. Whether there were any means at the command of European engineers by which the river could be confined in some regular course, so as to relieve the population from the perpetual menace under which they live, was an interesting problem. It not only menaced with sudden destruction the present inhabitants, but it affected the existence of whole generations, because when it left one part of the country and found its way to another, the district which it left generally became a desert of sand, and the portion which it overflowed became a shallow lake, in which nothing could grow, and over which nothing could sail. He presumed it was not beyond the reach of European engineering science to save the whole of that mighty plain from these disastrous overflows and changes of the river bed, but of course it would be a gigantic operation, and would perhaps tax all the resources of European science. It would also require a vast expenditure of money, though that expenditure would ultimately prove a great economy to the Chinese nation. With its present knowledge of hydraulics and mechanical science in general, China was incapable of facing the difficulties of such a problem; but it was to be hoped that in their own interest, and in the interests of humanity, they would be induced sooner or later to call in the aid of European science, and then the gigantic task might be successfully undertaken by a gentleman like Mr. Dixon, and others of his profession, who could command all the resources of modern skill and science. The paper which had been read, and the discussion that had followed, served to show the intimate connection existing between the physical geography of a country and the welfare and advancement of its inhabitants. Geography in this matter linked itself with human interests of the most practical kind. The Society was very much indebted to those gentlemen who, like their gold medallists, Captain

Gill, Mr. Ney Elias, and Baron Richthofen, and like Mr. Morrison and others, had, during the last twenty years, given them more precise and accurate information with regard to the physical geography of China, and of the special conditions connected with its rivers, coal beds, and mineral resources, than all the previous 800 years had supplied, since Marco Polo first aroused the interest which Europe had taken in that country. China was a vast empire, and he believed it had a great future before it; but he would be a bold man who would attempt to prophesy how fast or how slowly it might advance in the path of improvement. It extended from Yarkand to the Yellow Sea, and from the Great Wall in the Mongolian steppes down to Hainan; so that it was considerably larger than the whole of Europe, while its population was more than double that of Europe. He was afraid that it had some of the peculiarities of colossal size. The megatheria of this world were generally very slow of movement, and there was something in the constitution of a Chinaman's mind which seemed to be connected with this condition of greatness. The Chinese were very slow to move, but when they were thoroughly convinced, it was astonishing with what perseverance and tenacity they kept on the course which they considered the best for their own interests. He thought some sparks of hope might be drawn from the history of the last twenty years. After the last war in 1856–7, they became convinced that Europe had power in the shape of military science that rendered it impossible for them, with all their enormous resources of men, to offer effectual resistance; and they determined that they would acquire that power which enabled such insignificant people as the nations of Europe to conquer them. Since he first went to China some thirty years ago, they had established at least four great arsenals and dockyards. He went over one at Tien-tsin just before he left. It had been formed on the plan of the Woolwich Arsenal, and was nearly as extensive. It had all the best European machinery, and had succeeded in inducing some of our best workmen to go out there from Woolwich. They also took care to have good English directors; and Chung-how, who was then at the head of it, had just laid down a line of rail over a distance of a mile and a half to connect the different workshops. There was no engine, but the waggons were pushed along by the Coolies. He (Sir R. Alcock) said to this official, "You will be known in future history as the first Chinaman who introduced a railroad into your country. How did you get the consent of your Government?" He replied, "Oh, I did not ask them. I have put it down, and I shall get the approval afterwards." They had also built a great number of excellent steamships, and, latterly, he understood they had produced one or two armoured vessels; so that they were creating a Navy. According to the last accounts, they were even going too fast for some British interests, for they intended to establish cotton mills, which would compete with Manchester; so that although they had torn up the short railroad that was made against their will, and without their authority, from Shanghai to Wu-sung, he had no doubt that the enterprise had made its mark. The people themselves did not object to it, and were only too glad to have a new plaything. When he was in Peking the Minister often said to him, "We know all the advantages of telegraphs, railroads, and working mines, but we are not ripe for it yet; and when we are, we will do it ourselves." They had the Italian proverb in their minds, "*Si fara da se*" —they would do what they wanted, themselves. They did not want to enter upon these large enterprises, which would carry foreigners into the interior, until they were in a position to fix their own terms, and, in fact, to employ Europeans merely as their servants. Although none now present might live to see it, he had no doubt that the Grand Canal would ultimately be repaired, the Yellow River would be confined within its proper limits, railroads would extend from the north to the south, coal and iron mines would be worked, and cotton mills would be established to supply their own wants without sending to Lancashire. But these things would only come slowly and it might be irregularly. The explorations which were being made into the country would no doubt help on the great work, and China would be the last part of Asia to advance in the direction of improvement. Papers such as those which had just been read served a very useful purpose, not only in keeping the attention of Englishmen alive to what was going on there, but, by being translated into Chinese, they came under the notice of the ruling classes in China, and it must inevitably follow that sooner or later their minds would be opened to the progress which had been made in the rest of the world, and the necessity there was for their keeping pace with Western nations. He was sure that the Meeting would accord a vote of thanks to Mr. Morrison for his interesting paper, and they would at all times be glad to hear more about so interesting a country. The Yellow River, which had hitherto been the one thing in China given to change, might at no distant period supply the motive for change and progress in many other directions, and not for destructive but beneficent purposes.

Journey through Central South Africa, from the Diamond Fields to the Upper Zambesi. By Dr. EMIL HOLUB.

(Read at the Evening Meeting, January 26th, 1880.)

Map.*

Introduction.—During my stay of seven years in the southern part of the African continent, I made three journeys into the interior. I have chosen for my theme this evening an account of my last journey; but before doing so, I will take the liberty of making a few remarks on the reasons which led me to go to South Africa, and on my first and second journeys into the interior. In the year 1872, I left my home at Prague, with the intention of visiting South Africa. My chief motive for doing so was the desire to gain for my native country of Bohemia a share of the honours of African exploration, and also to enrich the museums both of Austria and Bohemia with collections of the natural history and ethnography of those regions. I imagined that I had sufficient means to carry out my intention; but being entirely unknown, and unconnected with any Society, I could not obtain any support from scientific bodies, and left Prague with the sum of 53*l.*, which was lent me by a few gentlemen, and which I had to return three months afterwards. I had no great knowledge of South Africa, except from Livingstone's books, and imagined that 53*l.* would be quite a fortune. I thought rather differently when I arrived at Port Elizabeth, and had to pay the duty for my guns, for I found by that time that my 53*l.* had decreased to 3*l.* I remember very well the day on which I set my foot on the South African shore; and I must confess that it was not one of the pleasantest days of my life. I was in a country where I could not speak the language, for I was unacquainted with either English or Dutch. There I stood, with two guns, a small supply of medicine, and

* Unavoidably deferred to the next (April) number.

my diploma. Fortunately, I found in the Austrian Consul at Port Elizabeth a friend, who introduced me to several German families there, and before long I had some patients. I had tempting offers to remain in Port Elizabeth, and to establish myself in the Orange River Free State, but there were other medical men in the place, and I took my way to the newer region of the Diamond Fields, where I arrived on the 26th August, 1872. But the practice of a medical man in the Diamond Fields was not so pleasant as many people would imagine. At that time this district was very different from what it is now. At present, the people live quite comfortably in stone houses; but in 1872 the population roughed it in canvas tents. I hired one of these tents; it was about 6 feet broad and 8 feet long, and formed my consultation room, my bedroom, my dispensary, my laboratory, and my workshop, where I prepared my snakes, and stored my collections. Very often when a patient called on me in the middle of a hot day, the rays of the sun burned through the canvas just as if we had sat outside in the street, and I had to hold an umbrella over myself and my patient. It was similar when there was any rain. In this way I practised until February 1873, by which time I had earned enough, as I thought, to enable me to start for my first journey into the interior. This journey led me to the Southern Bechuana country, and the southern part of the Transvaal. After two months' travelling I returned, and practised again up to the 3rd of November, 1873, when I started on my second journey, which lasted six months, and during which I visited four of the Bechuana kingdoms, as far as Shoshong. On my return I found it rather difficult to obtain the necessary funds for my third journey, because my patients said I was in the habit of starting off and leaving them to the mercy of other medical men. However, on the 6th of March, 1875, I started on my third journey, which lasted twenty-one months; during which I visited all the Bechuana kingdoms, and the empire of the Marutse, north of the Zambesi. To give an account of this journey is the object of my present paper.

I directed my course by Christiana, Driefontein, and Houmansflei, towards the chief village of the Harts River Koranas, named Mamusa. At the Hallwater salt-pan I had the opportunity of ascertaining that the so-called "ruins of Monomotapa" (Motapa, Mosagra) are nothing but a surprising freak of nature. From Mamusa I took a northerly direction towards the course of the Upper Molapo. After passing through the village of the Mamusa Koranas, who form an enclave of Hottentots in the midst of the Bechuanas, I crossed first the southernmost independent Bechuana kingdom, that of Mankuruane, who rules the Batlapins; then towards Molapo I entered the second, that of the Barolongs, ruled by Montsiwe (or Montsua).

The country between the Harts River and Molapo is flat, with a few low forests of mimosa, but inhabited by abundance of game, such as the springbock and blessbock, the white-tailed gnu, &c., and is the hunting-ground of the neighbouring tribes and of a few Dutchmen. These mimosa forests extend from about 20 miles south of the Molapo to the other side of that stream, and from thence the central part of Southern Africa is covered with woods, interspersed with salt lakes and flat open spaces, as far as the Zambesi, and even beyond that river right up into Central Africa. Between the Harts River and the Molapo there is a great number of salt-pans, from some of which very good salt is procured; these are the continuation of those between the Harts River and the Orange River, forming the southern portion of an immense chain of salt-pans and salt lakes extending from the Orange River towards the Zambesi in a straight line, ending about 100 miles south of the junction of the Chobe with the Zambesi. I found that Montsiwe had left his old residence Moshaneng, and had established himself on the south of the Molapo at a small *spruit* called Lothlakane, which is a few miles distant from the town belonging to his brother and sub-chief Molema. I was treated well by him, as I had been also on my second journey. From Molema's town I took an easterly direction, partly in order to explore the interesting valley of the Upper Molapo, partly that I might ascertain the boundary line of the Transvaal Republic in this direction.

To give in a few words the most characteristic features of the tribes among whom I travelled, I should say that the Batlapins, who could do a great deal in agriculture, and could well supply the Diamond Fields with grain, appear not to care much for work, but are greatly given to the vice of drunkenness; these people are not to be relied upon, and I must say the same also of their king. The Koranas have accepted all the white man's vices, but none of his virtues, and I think that from this cause and from their never doing any work they are gradually dying out. The Barolongs are, next to the eastern or Shoshong Bamangwatos, the best of the Bechuana tribes. To some extent they are hunters, but they are also good agriculturists and cultivate our wheat and imitate our style of European houses; and as, owing to the measures taken by the present Government at the Cape, guns and ammunition can no longer be taken into the interior, they will be all the more likely to take to agriculture, and to improve both bodily and mentally. This is the more probable, as they are ruled by a man of good disposition, who has shown true love and esteem for the English Government in South Africa.

Going up the Molapo and through the interesting scenery of the Hyeronymus Valley, I entered the district of Jacobsdal, and afterwards Zeerust, a village of the Marico district, which is so fertile and so rich in mineral treasures. From Zeerust I visited Linokana, where a German missionary, Mr. Jenson, is settled, who understands agriculture, and has set such a good example to the Baharutse amongst whom he lives, that they are now the wealthiest natives in the interior.

There are at least two hundred ploughs in this village of Linokana and a very great number of waggons, and I found them still improving, draining marshes and extending their fields; they bring a good deal of corn to the Diamond Fields for sale.*

After leaving Linokana, I passed through the eastern corner of the third independent Bechuana kingdom, that of the Banguaketse, ruled by Khatsisive in his town of Kanya. Kanya, like Mankuruane's town of Taung, is a station of the London Missionary Society; Lothlakane, of the Wesleyan Missionary Society.

Besides the Banguaketse, there are Baharutse, in Moshaneng and Manupi, near the destroyed town of Kolobeng, who live under the sway of Khatsisive. The Banguaketse are inferior to the Barolongs; the same may be said of their chief, who, however, being a true friend of Montsiwe, seems to have been lately following his example. Thus Montsiwe has prohibited the sale of intoxicating liquors in his kingdom, and Khatsisive, who had given a license for a canteen in Kanya, has had it closed during the last year and a half.

On departing from Khatsisive's territory I crossed the Dwars Mountains by the Schweinfurth Pass and entered the eastern part of the kingdom of the Bakuenas, ruled by Sechele, whose previous history combined with my own personal experience gave me a bad opinion of his truthfulness and sincerity, both towards the white man and the neighbouring native tribes. The Bakuenas, over whom he rules, are not drunkards like the Batlapins, but they are just as low in character, as shown only too truly in the cruelties they practised on the Bakhatla in the late wars. Sechele lives in an elegant European-looking cottage, at a place called Molopolole. At first he lived in Kolobeng, then in Liteyana, and finally settled at Molopolole. I entered his country through the district inhabited by a tributary tribe, called the Batloka, who live in the village of Chuni-Chuni, and are ruled over by a sub-chief, called Matlapin. From Chuni-Chuni I took a northerly road along the great Marico to its junction with the Limpopo, and from the time I entered the Marico district was richly rewarded in my geological researches. On the banks of the Limpopo I met a great number of the "Damara trekkers," i. e. Dutchmen who, being dissatisfied with President Bürgers' *régime*, congregated here for an expedition into Damara-land to try and establish a new republic there. My attempts to persuade them to give up their intention were certainly not listened to, and their subsequent deplorable fate justified the few words which I took the liberty of publishing about them in the 'Diamond News' at Kimberley, for they were unable to obtain any good ground for a settlement, and numbers of them and of their cattle perished. I crossed the Notuany, and after having crossed the Sirorume and Humboldt's Spruits, I entered the great territory of the fifth Bechuana kingdom, that of the Shoshong or Eastern Bamangwatos, so called by me to distinguish them from their neighbours, the Western or Lake Ngami Bamangwatos. I passed the great salt-pan called Khame's Pan, and entered King Khame's residence, Shoshong, on the 19th of May.

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* I must mention that, taking into consideration all deviations from right to left, I traversed 317 miles in thirty-three days during my journey from Kimberley to Linokana.

Before giving an account of this king and his subjects, and of my journey through their country, I think it necessary to make a few general remarks on the Bechuanas of Central South Africa. They live in six independent kingdoms, and besides this there are some of them in West Griqua-land to the south, in the Transvaal colony to the east, and in Matabele-land to the north-east of their own country. The four kingdoms which I have already mentioned lie one beyond the other from south to north, in the shape of parallelograms, whose greatest dimension is from east to west; the country is thus divided into long strips running from the border of the Transvaal to the western part of the Kalahari Bush-veldt (not Kalahari Desert, as it is sometimes incorrectly called). The eastern parts of these countries are the best watered, consequently there the Bechuana towns and villages are placed, but the central and western parts, which are drier, are inhabited by their slaves the Masarwa, or Makalahari, who have to keep guard in these parts, and to hunt the wild ostriches for their masters in the east. These latter often come down to the Diamond Fields to be employed as servants by the digging community. No white man is allowed to enter the Kalahari Bush-veldt.

The fifth kingdom, that of the Shoshong Bamangwatos, forms a trapeze having its shorter base to the north, bounded partly by the Zambesi, and partly by the Chobe, and is nearly equal in size to the whole of the other four kingdoms I have mentioned, namely, the Batlapins, Barolongs, Banguaketse, and Bakuena. Most of the Bamangwatos live in the southern central part of their country among the Bamangwato Mountains, but a number are also dispersed over the country, having the reddish-brown Masarwa as their servants in all parts except the north-west, where they are replaced by the Madenassana, who are black and are very well formed.

The Western Bamangwatos are placed between the Eastern Bamangwatos on the east, the Damaras on the west, the Bakuenas on the south, and the Chobe River on the north, their country being nearly quadrangular in shape. The residence of their young ruler is built on the banks of Lake Ngami.

The Eastern or Shoshong Bamangwatos are the best in character amongst all the Bechuana tribes, and their chief Khame is a true native gentleman. He tries to abolish the heathen customs (differing thus from Sechele, though the latter has become a Christian since Dr. Livingstone's visit), and has abolished not only the liquor trade but also the importation of liquors. In short, I could, if desired, bring proof of his great ability, his sincerity in doing good, and his exemplary management of the affairs of his kingdom. It is a pleasure to me to say that his character has been formed by the influence of a white man whom I consider, from his behaviour and from his knowledge of the native character, to be the most experienced missionary in South Africa, namely, the Rev. John Mackenzie, who is much liked by those of all creeds who have had opportunity to deal with or converse with him.

The Western Bamangwatos, though far behind their eastern neighbours, seem lately to be doing their utmost to gain a position like theirs, and we may hope that as their king is young he may be led to become a good ruler and trustworthy man like his and our friend Khame.

I had visited Shoshong before, on my second journey, and here, as in all other towns, I exercised my profession among the natives. I thus not only gained the confidence of tribes and chiefs and was better treated, but enjoyed opportunities *ad libitum* of studying the native character and customs.

The distance traversed between Linokana and Shoshong, including many deviations for the purpose of exploring interesting places, was 363 miles, which took me twenty-six days. After a fortnight I left Shoshong, being provided by the king with one of his own "boys." I crossed the interesting Bamangwato Mountains by the Unicorn Pass, travelled along the Letloche Spruit (running into the Mahalapse), proceeded to the pits of Kanne, and then further north to the drift of the Luala. The country traversed was a sandy forest, very difficult to pass through with a waggon, and an occasional valley with a few widely-scattered Bamangwato cattle-stations. The country towards the north-east, from Bamangwato to the Zooga River, is called the Great Thirst Land, the whole being a bed of deep sand with forest, to the extent of about 110 miles. In the winter there are only five watering-places, but the sandy soil contains plenty of water from 8 feet to 14 feet below the surface; and if the pits were properly dug out, and watched so as not to be destroyed by the wild animals, double the number of watering-places could be established.

Here it was that the Damara immigrants lost so many of their cattle, which, being maddened by thirst, ran away in all directions; some died from exhaustion, and some were killed by wild beasts; but all those which were caught by the Bamangwatos were taken to Shoshong and afterwards sent into the Transvaal.

The Luala Valley, with its branches, is one of the most interesting spots in Khame's country, especially with regard to its geological formation. Departing from thence, I crossed a high, wooded, sandy plateau, and rested for a while, after a journey of 52 miles, at the next watering-place, namely, at the pool of the very extensive Magne Plateau, which is overgrown with the oily-leaved mapani-tree, and has an immense extent of good soil. My sojourn at the pools was rather unpleasant. Although I had a guide given me by the king, I was troubled by the Bamangwatos, who thought I was a hunter by profession, and have quite a dread for all such men (characteristic of these parts, from 21° 30′ S. lat. northwards), which has been occasioned by some Dutch hunters, who, when staying on the plateau for some months, killed a very large number of elands, striped gnus, zebras, giraffes, and ostriches, only for the sake of their skins, leaving the flesh as food for the vultures. Since that time Khame has made a law that they shall not hunt elephants or ostriches in his kingdom any more, and of other game only as much as is needed for their food.

The next trip was to the Nokane Springs, and was still more troublesome, as I had to accomplish 72 miles before reaching the nearest watering-place. The Nokane is a spruit running into the very interesting Salt Lake Basin in the northern part of Central South Africa, which is, in fact, united to the basin of Lake Ngami. Here I must call the attention of all travellers to the numerous traps set by the Masarwa with poisoned assegais in order to kill the powerful Koodoo-bock (*Strepsiceros capensis*).

Going down to the said basin, and travelling towards the north, I observed three immense salt-pans or salt lakes increasing in size towards the north, each one surrounded by smaller ones with numerous inlets, and the forest separating them one from the other also contained an immense number of smaller pans. They are only filled with water for a short time after heavy rains. The three lakes have an average depth of from three to four feet, and are connected with Lake Ngami by means of the Zooga River, and with the Limpopo and Indian Ocean by the Chaneng (or Beautiful River), which is a tributary of the Shasha. The greatest breadth of the salt lakes is from east to west; they form a series of triangles with their points towards the west, and connecting with the Zooga or Lake Ngami River. The greatest breadth of all of them is from north to south, and on their eastern extremity. The southern lake is called Tsitane, and is about five miles across from south to north; the middle one, Karri-karri, is from 8 to 9½ miles across, and the northern one, Soa (or Shua), more than 20 miles; their length from east to west I should judge varies from 20 to 50 miles.

The geological structure of this basin is most remarkable, especially the saline incrustations in the bed of the great Kata River, worthy of especial notice. The banks of these salt-pans are covered with stiff, prickly grass. It is difficult to obtain drinking water in the vicinity; I have marked on my chart the places where it is to be found, generally deep in the forest. All the salt lakes are fed by rivers running after rain; thus the Tsitane is fed by the Tsitane and the Nokane, and the Karri-karri by numerous streams; it has also an affluent to the N.N.E., called the Mokhotsi; the Soa receives the greatest number of affluents, the most important of them being the Nata from the N.N.E., running into the north-east corner of the lake.

Between the Karri-karri and the Soa I crossed the River Chaneng, which flows east, north-east, and south-east, and which I look upon as an effluent of the Soa, and connected through the Shasha with the Limpopo.

I hope in the following manner to explain the fact that travellers have observed the Zooga flowing sometimes to the east and sometimes to the west. When the shallow water called Lake Ngami is filled to overflowing by its western and southern tributaries, the superfluous water passes eastwards through the Zooga into the salt lakes, which, being also very shallow (especially the Soa), and not able to hold a large mass of water, throw it off towards the east. But if, on the contrary, the tributaries of Lake Ngami cease to supply it with a large quantity of water from the north-west and south, the lake sinks, and the Zooga commences its return journey: the flow towards the east not only ceases, but if the salt lakes happen to be filled by their tributaries towards the west (namely, the Tsitane and the southern and northern affluents into the western halves of the Karri-karri and the Soa), they all, owing to their equal depth, form one immense sheet of water from three to four feet deep, and pour off their waters through the Zooga. Thus, if Lake Ngami is full the Zooga flows to the east, and if the salt lakes are full the Zooga flows to the west.

Having no horses at my disposal, I was unable to ascertain whether the Chaneng River communicates with the Zooga directly, or only through the Soa. Excepting the Zooga, all the tributaries of the salt lakes flow only during a short portion of the year. The extreme shallowness of the salt lakes causes a very quick evaporation of the water. This basin is all the more interesting by reason of the tropical vegetation: many species are there first met with on coming from the south; there is also a great variety of birds. I must make especial mention of the country surrounding the mouth of the Nata River; many different species of quadrupeds are here to be met with, and I spent days in observing their habits, more particularly those of the lions, which are so plentiful that along the Lower Nata I found regular paths trodden down by them. But I must also warn the traveller to be careful when traversing this part of the country on account of the Matabele (Zulus), who yearly visit the Lower Nata to get salt, and behave very badly to all whom they meet with, whether black or white; they generally take possession of your servants, and threaten to kill them if you do not pay a ransom in different articles for the head of each one. The best thing to do is to remain in the forest about seven miles away, and send your servants as spies, to see if there are any Matabele fetching salt. If there should be any, keep quiet and do not shoot, but continue your journey after they have departed.

Leaving the Soa, I proceeded up the Nata, crossed it, and then took a northerly direction towards the Klamaklenyana Springs (this name means "the four following each other," "springs" being understood). I thus entered a high sandy plateau, a thickly-wooded forest where there are no rivers, but thousands of pools, the greater number of which only contain water after rain, and which I named the "Sandy Pool Plateau." Where I crossed, it is 102 miles in width. From Klamaklenyana I visited the pools of Yoruah (a leap), Tamafopa (a bleached skeleton), Tamasetze (white sand), Henry's Pan, Naga-Tatolla, and Kybaka, all containing water, but the four pools at Klamaklenyana, and the three following are the only ones which contain springs. Altogether I counted 119 on my route. Here in coming from the south we met with buffaloes, elephants, and rhinoceroses for the first time. I must call attention to the fact that it is dangerous to cross this plateau from October till December on account of the growth of a poisonous lily, which kills the cattle in a few hours. After the grass has grown up the cattle do not touch this poisonous plant. I found the limits of the tsetse were from 10 to 15 miles east of the direction which I took.

On the 30th of July I arrived at the sources of the first tributary of the Zambesi, the Deykah (Daka) River, which, like most of those uniting with the Zambesi below the falls, is a perennial mountain stream. On the following day I arrived at the valley of the Pandama Tenka, where a temporary trading station was established, and where I was kindly treated by Messrs. Westbeach and Blockley, former traders on the Zambesi. Three days afterwards I started for the Chobe Valley, leaving my companion Mr. T. in charge of my waggon and property at Pandama Tenka. I took my Cape Town boy with me, and Mr. Blockley was most useful as interpreter.

Eight miles from Pandama I crossed the first boundary of the tsetse, coming afterwards to a part free from tsetse, and the second time entering a part infested by it about 21 miles south of the Chobe junction.

The whole distance was about 70 miles, of which the first part was rocky, with many valleys, the second one (about five-sevenths of the whole) wooded, with many marshy flats, and abounding in game; the soil of the valley and flats very promising for future cultivation. I remained several days on the right bank of the Chobe, about four miles and a half above the junction, waiting for the answer to a message I had sent to Sepopo, the king of the Marutse-Mabunda empire, north of the Zambesi (at that time residing in Old Sesheke), announcing my arrival and asking permission to enter and explore his territory. I fired off my guns, on which the Masupia living on the Delta Island, at the village of Impa-lera ("entrails of a wizard"), which is a watchpost of the empire against the Bamangwato side, came over, heard my message, returned, took to their canoes, which are kept in the Zambesi at the Makumba landing-place, about two miles and a half above Impa-lera, and started for the king's residence, which they could reach in two days.

The Chobe, or Luyana, or Linyanti River, is a broad but marshy stream, in a very unhealthy valley, and is twice connected with the Zambesi before its real junction, first by an arm several hundred yards above the junction, forming the islands of Pagne, and then six miles above that by marshes, four miles and a half above the real junction rapids in the Zambesi, and five or six miles above the junction rapids in the Chobe.

The Masupia, like fifty more tribes, are slaves to the Marutse, paying dry fish, fresh hippopotamus meat, skins, ivory, and honey as taxes.

After a few days Sepopo's messenger returned, bringing a friendly answer and five boats manned by twenty-five men to bring us to Sheshoke. I entered Impa-lera, and was kindly received by Makumba, but he would accept no presents till the king had first been satisfied. After a passage of two days up the Zambesi, on a part navigable for large boats, I arrived at Old Sheshoke, a Masupia village which had been lately chosen by Sepopo for his residence in preference to the province Barotse, for several reasons, but principally because he disliked the trade with the Portuguese coming from the west, and wished to be nearer the English traders from the south.

On the first day of my voyage I observed the banks and islands covered with luxuriant tropical vegetation, the marshes inhabited by numerous elephants and hippopotami, the river by otters, crocodiles, large lizards, and fishes. On the second day the southern bank was marshy, the northern bank was one very large meadow, bordered by a forest, and inhabited by thousands of wild animals—pooku and letschwe, Riet and Orbeck's bocks, striped gnus, zebras, and buffaloes. On the banks of the river many fishermen's huts are scattered, annually occupied by Marutse, Masupia, and Mamboë fishermen.

I was well received by Sepopo, who was measuring out the ground for New Sheshoke, and gained permission to travel and explore, if I promised to do as "Monari" did, i. e. not to interfere with the customs, and not to kill elephants. In the same way as Livingstone is esteemed up to the present day by the Bechuanas of the South Zambesi under the name of "Naka" (a physician), so his memory is preserved with similar esteem north of the great stream, but he is known there by the name of "Monari" (a gentleman, or master) among these tribes.

I could have started at once with promised carriers for Bangweolo, but unfortunately I thought more might be done for the honour of science by going up the river, and so I decided for the latter. I then agreed to return to my waggon at Pandama Tenka, send the waggon to the south, and then retrace my steps to Sesheke, where I was to receive four boats and a crew with which to explore the Zambesi, if I liked to go to Loanda. Before leaving I accepted a Portuguese trader as guide, and had also the opportunity of observing that the countries between Angola, Mossamedes, and Benguela, also among the great lakes as far down as the Victoria Falls on the Zambesi, are so well known to the Portuguese traders (both the white and the Mambari, i.e. the mixed race) that they know every tribe and chief, all the rivers and mountains, and the good or bad character of those with whom you have to deal; in short, I found this "terra incognita" well known to them. The information about these parts given me by these traders, I afterwards found corroborated by the two survivors of Livingstone's party—the two headmen, Marancian and Rama-kokan.

I had to pay my guide four tusks of ivory to guide me as far as Matimbunda. Before leaving Sesheke I witnessed the conflagration by which Old Sesheke was destroyed; New Sesheke was built up in two months. Returning to my waggon I found that those Manansas (a tribe living south of the Victoria Falls) whom I had intended to hire as carriers to convey my goods to the distant Chobe, were already hired by some hunters, and also that my companion, disliking to cross the river, refused to go with me; my Cape Town boy behaved in such a way that I had to discharge him, and the Bamangwato guide had orders to return to Shoshong. There I stood, making ready for the great journey, but without a soul to go with me. At this time the trading station was visited by the before-mentioned trader, Mr. Westbeach, and the Shoshong trader, Mr. Francis, who promised to get some Manansas for me if I would go with them to the Falls, to which I agreed, and feel now extremely glad that I made this deviation to the north-east, for it was well worth some little trouble to be enabled to admire this wonderful phenomenon of nature.

Next to the Lower Nata I found the vicinity of the Falls best rewarded the natural history explorer. During my stay of three days I employed myself in making a survey of the Falls, and found close to them some rich iron mines, which have been in former times worked by the natives. The country south of the Falls, inhabited by the fugitive tribe of the Manansas, is claimed by Khamo as well as by Lobengule. The country north of them is inhabited by the Manansa, Matonga, and Batoka natives, who pay tribute to the court of the Marutse.

On the 6th of October I crossed the Zambesi for the second time, and arrived in New Sesheke on the 9th, where I found that the natives who were to wait for me had gone up the river, the king excusing himself by saying that I had lost a good opportunity, and must wait till he could supply me with men and canoes. And it was only after the king had finished building New Sesheke, and returned from a long elephant hunt, and after he had been urged by his wives to accede to my request, that he gave me four canoes with a crew to continue my journey. This was on the 1st of December, 1875.

My sojourn at Sesheke, up to the 1st of December, I employed in studying the natural history and geography of the country, and in paying some attention to the languages. During my visit to the Fields I had learnt a little of the principal language of the Marutse country, and after hiring servants in the Zambesi valley, began to make myself understood, thus gaining more acquaintance with the language till I was able to talk with the people. The present language is a kind of Sesuto, the language of the Makololo, intermixed with some elements of Sirotse, the language of the Marutse. After the annihilation of the Makololo, when only two men, besides women and children, were to be found in the Marutse empire, and among the Bamangwato of Lake Ngami, their language, without any efforts by the ruler and his government to bring it forward, became the principal language of their oppressors. I learnt about seven hundred and fifty words and phrases of it, and between three hundred and three hundred and fifty words of both the Matonga and Manansa languages.

The present Marutse empire is rich in materials for study, and I shall be able greatly to extend my ethnographical sketch published by the Geographical Society in Vienna under the title of 'Eine Kulturskizze des Marutse-Reiches.' When compared with the South African tribes (I consider the Zambesi the natural line of demarcation for Central Africa), the tribes of the above empire are far ahead of the Hottentot and Bushman, Bechuana and Kafir, in their mental capacity and in their handicrafts; only in a few branches of the latter are they approached by the South African Mashonas, in the sewing of garments (karosses) by the Bechuanas, and in sketching and painting by the real Bushmen. I can say that the Marutse empire has a civilisation of its own. Having gained their full confidence, I could move among them and study their customs, penetrating even to their practice of charms, and ascertaining their religious ideas; things which appeared quite new to my friends in the South African colonies, being so different from the customs, manners, and abilities of those who are at present the white man's neighbours.

On the 1st of December, I received permission to leave with four canoes and a crew of about thirty-five men. My four "boys," my real body guard, hired in October (a Masupia, two Matongas, and a Manansa), were not allowed to take a seat in the canoes, but had to walk along the bank. My crew had to be paid off in the Barotse, new men were there awaiting me, who had to go as far as Mamboë-land; in short, each tribe had to supply me with a new crew, but from the Mamboë, the last towards the N.N.W., I had to get men with orders to go right up to any of "the great waters" (seas) I should choose.

Sepopo was a cruel man, and the few white men who had attempted to deal with him as traders or hunters had all in the end been badly treated. I can only complain that he detained me, but of nothing more. I was entirely at his mercy and that of his people, but I lay down to sleep without fear.

On the third day after I started I was unfortunately seized with fever near the Katonga village, the day after my foremost canoe, containing all my shooting apparatus except the cartridges, my provisions, medicines, botanical specimens and insects, capsized before my eyes in the Mutshila Amsimba Rapid. When I, to my horror, saw this disaster happening before me, I saw also all my hopes and the success of my plans for crossing the continent and exploring the parts I traversed, so that they might not only at some future time, but if possible at once be opened to trade, going down and vanishing too. My illness increased daily, the continued rain making matters worse; but I pushed on. I intended to wait a day or two at the Nambwe Cataract, on the southern Barotse, to see if there would be a change for the better, but I became senseless; there came an order then from Sepopo, who had been informed of my state by Inkambela, the chancellor of the empire, who was going down to Sesheke in a boat, that I should be brought back at once to Sesheke. The king, thinking himself a doctor, and also a magician, considering the Portuguese Mambari doctors magicians (who openly professed to be so), looked upon me—who was able to cure diseases which neither he nor they could heal—as a very great magician indeed, and so he thought that if I should die in his territory some great disaster would befall his land and people; therefore he gave the order to bring me back, and if I did not improve in Sesheke to send me south of the Zambesi to die there, without causing any evil consequences to him or his belongings. So after a journey of ten days I was brought back to Sesheke.

But before proceeding to give an account of this third sojourn in the Marutse king's capital, I will devote a few words to my journey up the river. In my trip from New Sesheke to the Nambwe Cataract, I found the first two-thirds of the Zambesi navigable, also the whole distance from the before-mentioned Makumba Rapids near Impa-lera, right up the river beyond Katonga. But the western half of this length is more dangerous than the first half (from the Makumba Rapids to Sesheke), on account of a great many snags projecting from the river; the remaining third was quite unfit for navigation, being difficult to traverse even with the very narrow native canoes. In a distance of less than 19 miles I counted forty-five rapids, besides the cataract. The rapids are caused by a rocky bed, which forms a connection between the chains of hills that in this part run parallel with the river on each side.

The scenery of the river is here more like that of a giant mountain stream; the banks from Sekhose down to the Makumba Rapids are flat and marshy, covered with forests and reeds, and yearly more or less inundated, the inhabitants of these parts living in small scattered villages on a few small prominences in the parts overflowed. Having navigated the river when the water was at its lowest, I could well study the rapids and islands, which it is impossible to do during the rainy season. All the islands in the river, whose banks are flat, are more or less marshy and overgrown with papyrus. From the Makumba Rapids Shesheke I have marked them with figures, also from Shesheke to the Mambwe Cataracts. All the more important ones I named after our most distinguished African explorers. From Sekhose to the said cataracts—during the length having the character of a large mountain stream—counted and put down more than 300 islands. The rapids I numbered and characterised, whether caused by an undulating or slanting sheet of rock or by boulders lying beneath or partly above the surface of the water, or by a stair-like rocky declivity, or by a wall of rock with few openings here and there, all these four kinds showing rocks running across the river in a straight or slanting line, or in the form of an angle. The boats have to be pulled or carried through or over them, sometimes unloaded and dragged along the bank till they were above the rapids.

On my return to Shesheke I remained in a dangerous state for several weeks, and when I was able to walk a few yards I left with some canoes which were taking ivory to Impa-lera. After crossing the Chobe I took up my abode for five weeks in the Leshumo Valley, about nine miles south of the Zambesi, where I had to endure one of the most wretched periods I experienced during my seven years' stay in Africa. Not being strong enough to go out hunting, and my four boys being afraid to make use of my breechloaders, thinking there was some charm in the manner of loading, I had only Kafir corn to live on, which food did not cause any change for the better in my illness. At last I was visited and well taken care of by the trader Mr. Westbeach, and started with him for Panda-ma-tenka. When starting a few months before, the second time, for a journey to the north of the Zambesi, I intended not to return to the south, but to go out to the west, and so I had sold my span of oxen; now, on my return, I was obliged to load the specimens I had collected on the trader's ivory, and in this way I brought them down to Shoshong.

The return journey I made by Western Matabele, through the country of the Western or Menon's Makalaka, a very thievish tribe. Some thirty years ago they were a peaceful, well-disposed tribe of cattle-breeders and agriculturists, but they have now the worst reputation among the tribes of Central South Africa, their character having been altered so much for the worse by their conquerors and oppressors, the

Matabele, a Zulu tribe. I crossed the Nata River about the centre of its course, and travelled up the May-tengue River. This river is the "soul" of the Western Makalaka province; it is one of the remarkable sand-rivers, and has thousands of tributaries, all of which, however, only appear on the surface after rain, running below the sand for the greatest part of the year, so that the river-bed generally appears nothing but a sheet of sand.

I have not space to allude further to their characteristic features, but may do so at another time. This May-tengue River, when it does flow—i. e. after rain—loses itself in a flat. The country through which it takes its course is, as far as I can tell in comparing the parts of South Africa visited by me, the most interesting plateau in South or South Central Africa. Thousands of granite mountains and hills, often of the most picturesque formation, are to be found there.

The Makalaka do not allow any white man or foreign native to be buried in their country; so two of the late explorers, Mr. William Oates and Lieutenant Grandy, are buried on their boundary line.

When crossing the Shasha and its tributaries, I found that the Shashe and Shasha—of which the one was supposed to unite with the Nata, an affluent of the Soa—were the two branches of the Shasha, a left-hand tributary of the Limpopo. The natives call the one branch the sandy and the other the rocky Shasha, according to the nature of their beds. I crossed the Shasha and the Tati River twice, travelled along the Rhama-koban, and after visiting the Tati station, left the Matabele for the Bamangwato territory. In my return journey to the south, I took whenever I could a different direction from that I had taken in travelling north, or on my way up and down in my previous trip (in 1873–74), going up the Notuany, visiting the Bakhatla at Mochuri, with whom the Bakuena king Sechele was then at war; I also visited Chuni-Chuni further down. From Linokana I took a southerly direction towards the Harts River Springs, and then along that stream towards Mamusa, arriving at the Diamond Fields at the end of November 1876.

This journey supplied me with more than 530 sketches, and (including my trip southwards viâ Cradock, Graham's Town, and Port Elizabeth to Cape Town) with the following classes of specimens: 1st, Ethnographical objects; 2ndly, Anatomical ditto, skins of mammalia, about 500 bird-skins, fishes, reptiles, over 13,000 insects, Crustacea, Vermes, Conchylia, corals, &c., &c.; 3rdly, Botanical specimens: a herbarium of about 3000 plants, bulbs, fungi, fruits and seeds, besides marine flora from the southern coast of Africa; 4thly, Fossils and minerals. The maps have been worked on a scale of 1 : 172,175, 1 : 43,140, and 1 : 1433, but only with the aid of the compass, taking the bearing every 300 yards.

The following discussion ensued:—

Commander V. L. Cameron said the narrative which Dr. Holub had given showed what determination and perseverance could do, even with very limited means. His object was to reach the sources of the Zambesi, near to which he (Commander Cameron) had passed in his journey across the continent, and he would be the first to congratulate Dr. Holub if he should be able to reach them in his next journey. They were all very much indebted to Dr. Holub for his interesting paper.

Mr. A. W. Mitchinson could corroborate Dr. Holub's statement that the Portuguese traders were penetrating into the interior of Africa from Bihé and the different towns between Benguela and Walvisch Bay. He had himself travelled from Benguela to Bihé, and had continued onward to Walvisch Bay. He could not say whether the traders Dr. Holub saw at Sesheke came from the east or the west coast, but he imagined they came from the east. A few months ago some of the traders crossed the Cunene with the intention to go further north. The Dutch from the Transvaal had penetrated to some extent into Damara-land, although they had to encounter great difficulties because they had 120 miles of bare sand to traverse. On the west side of the desert the trees were only three or four feet high. The great want of water prevented southern traders from going far north, and they would never succeed in doing so without a great loss of cattle and time. Of the 2284 head of cattle with which an English trader had recently started from Damara-land to Cape Town, a journey occupying seven months, only 248 arrived at their destination, and the owner was completely ruined. The Kalahari Desert, on the west side, was not a comfortable place for any traveller; but if the traders proceeded from Benguela viâ Bihé, where the Portuguese had been for many years well known, and where the chiefs were disposed to be on friendly terms also with the English, the interior of Africa would yield far better results to English trade than the country southward up to Walvisch Bay.

Mr. Hutchinson said the part of Africa with which the paper had dealt was not one to which his attention had been especially directed. Though not a traveller or a geographer, he was glad to be able to bear his testimony to the pleasure which all present must have felt in listening to Dr. Holub. He had been struck by one or two remarks with reference to the gradual extension of Portuguese efforts from the west coast towards the interior, and the gentleman who had just spoken seemed to confirm what Dr. Holub had said. There could be very little doubt that for many years the Portuguese had had a thorough knowledge of the interior of that part of the continent, and that opinion had been deepened in his mind by a careful examination of the old work of Pigafetta, who took down from his own lips Duarte Lopes' account of his travels, and produced it in 1591 by the order of Pope Leo VI. In that work the geographical features of the continent were described with an accuracy which showed that Portugal pretty well understood the continent at that time; and at the present time, when almost every nation in Europe, and even the United States, were coming to the front in African travel and research, and when Bohemia was also sending one of her sons into the same field, it was interesting to know that Portugal was reviving its former hold on that part of Africa. That country appeared to be doing so much now in the way of trade, that he was inclined to regard the River Zambesi as the northern limit of English enterprise in South Africa, so far as regarded the extension of trade. Those who were acquainted with the researches of Captain Elton, when he was consul at Mozambique, would understand that at one time the Portuguese held and worked the eastern half of the continent in the same way as they did the western half. The concession which had been given to the Zambesi Company would develop the Portuguese power very much in the old lines from west to east. He had been told that all the money required for that undertaking had been subscribed in Paris. Therefore, if Dr. Holub returned to South Africa, he, with the gentlemen who had gone out on behalf of the French syndicate, would place at the disposal of the Royal Geographical Society a complete exploration of Africa south of the Zambesi River. Being deeply interested in every effort to explore the hidden secrets of Africa, he desired on behalf of those who worked with him to extend to Dr. Holub the expression of their admiration of his pluck and energy, and of that power of observation, which had produced such results as those shown on the table.

Mr. FRANCIS GALTON said it was thirty years since he was in that part of Africa, and in fact the portion with which he was acquainted was just outside the region which had been so graphically described by Dr. Holub. Though he might be regarded as wandering from the special subject under consideration, he thought that Englishmen could not too vividly keep before them the conformation of Southern Africa, as a field for future colonisation and extension of the empire. Though South Africa was a large mass of land, it was by no means universally habitable. A desert of sand cut a great slice out of it, and comparatively few people could live in it at the sides of the scattered watering-places. From south of the latitude of the Orange River an area of sand extended northwards, including the Kalahari Desert, stretching past Walvisch Bay and along the east coast as far as the Cunene. In olden times Englishmen had this desert to their north, but now they had passed it and were coming face to face with the broad mass of savagery that inhabited the centre of Africa. All those tribes to which Dr. Holub had referred lay now on their flanks. Mr. Hutchinson had spoken of the Zambesi as the natural British frontier, but for his own part he regretted every step that was taken to the northward, for it led to countries less and less suitable for white men, and in which it was less and less easy to secure a peaceful frontier. In the high lands of the southern part of the Transvaal English children could be brought up in health, but at the latitude of the Limpopo, and in the lower levels, it seemed impossible for our race to naturalise itself. The enormous stretch of tropical country that Englishmen now had to occupy, whether in India or in other parts, was a serious tax upon the race.

The CHAIRMAN (Lord Houghton) proposed a hearty vote of thanks to Dr. Holub for his paper. In doing so he said that that gentleman had not only shown that he possessed great physical energy and power of observation as a traveller, but that, if he chose, he could become eminent as a man of letters.

GEOGRAPHICAL NOTES.

The Society's East African Expedition.—We inserted a detached postscript in our February issue, giving the substance of a telegram which had just reached the Society, to the effect that Mr. Thomson and his party had succeeded in reaching the southern end of Lake Tanganyika. The telegram was forwarded to the Secretary from Mozambique by Mr. Andrew Chirnside, a private gentleman on a visit to south-eastern Africa, and was worded as follows:—"Mozambique [Jan.] 9th (?). Thomson at Bambe, South Tanganyika, 28th October. Exploring west side. Livingstonia party there two days later. Distance 250 miles; country level; people friendly; cattle."—In traversing the belt of hitherto unexplored country lying between the two lakes, the expedition has completed the second part of the task imposed upon it by its instructions. The few words in the telegram descriptive of the region are of the highest interest and importance, taken in connection with the hopes that have been raised with regard to this comparatively short portage between two great stretches of navigable water in the heart of Africa. The presence of cattle means absence of the tsetse fly, and the possibility of a busy highroad being established between the two lakes Nyassa and Tanganyika. The continuation of Mr. Thomson's march along the west side of Tanganyika is also an important item in the telegram. Chuma, his trusted chief of caravan, is evidently determined that no time shall be lost, and we may expect soon to hear of the arrival of the party at the Lukuga outlet, which is the next important stage in their journey.

Mr. Stanley's Congo Expedition.—From a short official report of a visit in December last to the mouth of the Congo, by Commander Sidney Smith, R.N., we learn that the well-equipped expedition under the command of Mr. H. M. Stanley was then on its way into the interior. It consisted of sixty-eight natives and fourteen Europeans. One of the four portable steam launches with which it was provided has been lost in the rapids above M'Boma, the other three, with the frames of three houses, were to be conveyed by land, a distance of 300 miles, before the river could be again made use of. Four civilising Stations, according to the Belgian International programme, are to be established: one at M'Vivi, just below the first cataract, the second at Stanley Pool, above the falls, and the others in the far interior. A steamer of 120 tons is provided for communication between Banana (at the mouth of the Congo) and M'Vivi. Mr. Stanley had stated that it would take three years to carry out his project successfully.—M'Vivi (variously written Emvivi and Vivi) is built on a tract of level ground on the summit of a precipice 320 feet high, rising steeply from the rapid current of the river.

Contemplated Trans-Sahara Railway.—In continuation of our note on this subject last month (p. 123), we hear that Colonel Flatters, who is to command the principal expedition destined for the scientific exploration of the Tuareg country, has arrived in Algeria to perfect his arrangements. He is accompanied by M. Roche, an engineer, and, in addition, his staff will consist of the following officers and civilians:—M. Béringer, a government engineer, who served under M. de Lesseps during the cutting of the Isthmus of Suez; Captain Masson, of the staff; Dr. Guiard, an army surgeon; Captain Bernard, an artillery officer; Second-Lieutenants Brosselard and Le Châtelier; and two subordinate officials.

The Climate of Zanzibar.—In a paper read at a recent meeting of the Meteorological Society, Dr. John Robb, of the Indian army, furnished particulars respecting meteorological observations made at Zanzibar * during the years 1874–8, which are of considerable interest, as that island is the starting-point of most of the expeditions proceeding into the interior of East Africa, and are the more valuable as such observations do not appear to have ever been taken before, for more than a few months consecutively. The average annual rainfall of the five years was a little more than 61 inches, or about double that of England, and therefore it would appear, from the observations recorded by Dr. Christie and Captain Burton, that the rainfall of the island has very materially decreased in late years. It is thought not improbable that this may be due to the great destruction of trees over the whole island by the cyclone of April 15th, 1872. The average number of rainy days is 120, ranging from 101 to 139 during the period recorded, and only once in the five years did the rainfall of a single day reach 4·74 inches (December 1877). Zanzibar has the double seasons of unequal duration, which, though best marked out by the prevailing winds, are less exactly determined by the so-called greater and lesser rains. The advent of the rainy season corresponds with the sun's crossing the zenith of Zanzibar in its northern and southern declinations, that is on March 4th and October 9th. The greater rains fall in March, April, and May, the rainfall being heaviest in April, showing an average of 14·84 for that month; the lesser rains are from the middle of October to the end of the year, November and December giving an average respectively of 7·38 and 8·06 inches. The driest month is September, with an average rainfall of 1·86 inch. The mean temperature of five years is 80°·6, the hottest months being February and March, with a mean temperature of 83°·1 and 83°·4 respectively; the cool months July and August, averaging 77°·5 and 77°·7. This gives a small amplitude of yearly fluctuation—rather less than 6°—and to this limited range of temperature is largely due the debilitating nature of the climate of Zanzibar, particularly as affecting the nervous system. The range of the barometer at Zanzibar is 0·186 inch, when corrected and reduced. The mean pressure of four years is 29·944 inches, which is almost exactly that indicated at the equator (29·943 inches). The coast of the mainland of Africa, Dr. Robb says, is undoubtedly prejudicial to health, and both Europeans and natives of India, who pass any considerable time there, suffer severely from fever of a bad remittent type and from dysentery. All seasons of the year there are bad, but some are better than others, and travellers going into the interior are usually recommended to leave the coast region before the heavy rains begin to fall. February and March are the favourable months for starting, but, Dr. Robb adds, it must be remembered that the seeds of disease are not unfrequently sown by even a short residence on the coast, and death overtakes the traveller when he has advanced many marches into the more healthy interior. To avoid as much as possible encountering any such risk, travellers should always make a careful and quick march across the unhealthy belt of country along the coast, and pitch their camps in the higher and drier districts beyond, and, if duty should require their presence on the coast, they will act wisely in passing the treacherous hours of the night in a spot where the risk of contracting disease is reduced to a minimum.—Subjoined are the monthly results of meteorological observations at Zanzibar, given by Dr. Robb, for the five years 1874 to 1878:—

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* The observing station was at the town of Zanzibar in 6° 9′ 40″ S. lat. and 39° 14′ 20″ E. long.

Months.	Mean Pressure.	Temperature.									Humidity.	Rain.		
		In the Shade.							In the Sun.					
		Extremes.			Means.									
		Max.	Min.	Range.	Max.	Min.	Range.	Mean.	Max.	Mean.		Amount.	Greatest Fall.	No. of Days.
	in.	°	°	°	°	°	°	°	°	°		in.	in.	
January ..	29·851	88·8	73·3	15·5	85·9	78·6	7·3	82·6	179·0	168·6	79	2·33	2·08	7
February	·857	89·1	71·8	17·3	86·1	79·0	7·1	82·9	187·5	168·0	78	3·00	2·70	8
March ..	·858	90·6	72·8	17·8	86·1	78·5	7·6	83·2	174·0	167·9	80	5·92	2·47	12
April ..	·873	87·8	71·3	16·5	84·0	77·5	6·5	81·5	179·5	164·0	83	14·84	3·74	17
May ..	29·961	87·6	71·3	16·3	83·3	75·9	7·4	80·0	163·0	157·0	82	6·96	3·77	12
June ..	30·029	85·4	71·3	14·1	81·9	75·1	6·8	78·6	160·5	153·0	80	2·09	1·63	6
July ..	·037	83·9	69·8	14·1	81·0	73·8	7·2	77·2	156·5	151·7	81	2·32	1·95	6
August ..	·033	84·9	68·8	16·1	81·3	73·8	7·5	77·4	162·0	155·1	82	2·49	3·22	8
September	30·002	85·7	70·8	14·9	82·4	74·2	8·2	78·1	170·0	158·8	81	1·86	1·23	9
October ..	29·956	86·9	71·3	15·6	83·5	75·3	8·2	79·4	167·0	162·9	79	3·75	2·52	9
November	·904	87·6	71·8	15·8	84·3	77·1	7·2	80·9	177·5	168·6	78	7·39	4·63	14
December	29·867	87·3	73·8	13·5	84·8	78·1	6·7	82·2	176·0	169·2	80	8·06	4·74	13
Year ..	29·935	90·6	68·8	21·8	83·7	76·4	7·3	80·3	187·5	162·1	80·3	61·01	4·74	121

REMARKS.—Jan., N.E.; E.; calms; S. Feb., N.E.; E. in afternoon. March, N.; N.E.; variable W. April, Southerly in W. and E. May, W.S W.; S.S.E.; S. June, S.W. into S.S.E.; E. July, W.S.W.; S.; S.S.E.; N. Aug., W.; S.; E.; variable, calms. Sept., W.; E.; S.; calms; Northerly. Oct., S.; E.; N.; calms, variable. Nov., S.E.; E.; N.; calms, variable. Dec., N.E.; N.; steady, calm mornings.

French Exploration in West Africa.—The French Expedition which has just started from St. Louis to explore the country bordering on the Upper Niger, is under the command of Captain Galliéni, who is accompanied by MM. Bayol and Tautain, surgeons in the French navy. It is intended that M. Bayol should remain at Bamaku, while Captain Galliéni and M. Tautain will follow the course of the Niger to Ségou-Sikoro. According to present information, it is believed that the expedition will be well received among the tribes which they will visit in the course of their explorations.

Proposed Survey of Southern Africa.—Mr. David Gill, H.M. astronomer at the Cape, has recently drawn attention to the inconvenience arising from the absence of any satisfactory or trustworthy map of the South African colonies, and the necessity for their re-survey. He points out that the plans of adjacent farms do not tally and that they should invariably be referred to two of the points fixed by the triangulations of Sir Thomas Maclear and Captain Bailey, R.E. The first of these two surveys consisted of a chain of triangles extending from Cape Point along, or at a short distance from, the west coast, to within 60 miles of the Orange River. It was a work of the highest accuracy, and as far as it goes, leaves nothing to be desired. Captain Bailey's survey, the results of which are pronounced by Mr. Gill to have been satisfactory on the whole, consisted of a longitudinal series of triangles extending from Sir T. Maclear's southern triangles westwards along the coast to the Kei River. The above may be said to cover about one-fourth of the total area of the Cape Colony with a network of triangles sufficiently exact to form the basis of more detailed surveys. The only satisfactory method of completing the survey, on a system which will be at once accurate and conduce towards a better knowledge of the form and dimensions of the earth, is by the projection of chains of triangles in meridional and longitudinal series, and along coast and boundary lines. Mr. Gill therefore proposes:—(*a*) an extension of Maclear's arc to the Orange River. (*b*) A longitude series of triangles from Port Nolloth to D'Urban, following generally the 29th parallel of S. lat.; this series might be called the Orange River Longitude Series. (*c*) Another longitude series should run along the parallel of 31° 30′ S. lat. from the mouth of the Oliphant's River to Gordon's Bay, St. John's River; this might be called the Oliphant's River Longitude Series. (*d*) A meridian series intersecting the Orange River longitude series at Kimberley, and extending southwards along the 25th meridian of E. long. to the coast; this might be called the Kimberley Meridian Series. (*e*) A meridian series extending from Mossel Bay along the 22nd parallel to the Orange River, which might be called the Mossel Bay Meridian Series. (*f*) A meridian series extending northwards from East London along the parallel of 27° 30′ E. long. to the Limpopo River; this to be called the Kei River Meridional Series. (*g*) A meridional series extending from the mouth of the Umtamvuna River northwards along the meridian of 30° E. long. through Natal and the Transvaal to the Limpopo River; this to be called the Natal and Transvaal Meridian Series. (*h*) A longitude series extending from Delagoa Bay along the parallel of latitude 26° S. across the Transvaal to the borders of Bechuana-land; this to be called the Delagoa Bay Longitude Series. (*i*) Finally, a Transvaal boundary series connecting the northern limit of the Natal and Transvaal series along the course of the Limpopo. Base lines should be measured (1) somewhere between East London and Graham's Town, (2) near Port Nolloth, (3) near Durban, and (4) possibly another near the northern boundary of the Transvaal.—These proposed lines of triangulation would be so disposed as to make a gridiron of principal triangles sufficient for each colony separately and for the South African colonies as a whole. All well-marked points such as beacons, church-spires, &c., visible from each station, should be read upon, Mr. Gill considers, and when land is valuable, he suggests that secondary triangles, five miles to a side, should be projected from the sides of the principal triangulation. An annual grant of 5000*l.* for four years would, in Mr. Gill's opinion, complete the triangulation.

The Oxus and its possible Diversion to the Caspian.—A telegram, dated December 6th, from the chief of the Samara Expedition,* contained in a recent despatch from H.M. Embassy at St. Petersburg to the Foreign Office, gives much later news regarding the work of this important scientific mission than that we published in our January number (p. 68). After their journey through Turkistan the Expedition turned their attention to the Lower Oxus, and examined the district where the traces remain of its former course in the direction of the Caspian. The Laudan and its affluents have been explored, with part of the Darialyk, and the nine dams formerly constructed by the Khivans to obstruct the passage of the Oxus waters to its old bed, the Uzboi. We learn further that the Khan of Khiva has caused the dam at the junction of the Laudan and Shamrat with the Darialyk to be destroyed, and the Laudan to be deepened for a distance of eight miles; besides undertaking, early in the present spring, before the water reaches its full height, to destroy various dams, to deepen and widen the Laudan, and other channels for a distance of some 27 miles, and to admit the water into the Uzboi by the most direct route. The Khivans assert that they can force the water in a rapid stream into the Uzboi, especially if the Russians assist them by constructing a dam half across the mouth of the Laudan. Besides expressing his readiness to assist in the diversion of the waters of the Oxus, the Khan of Khiva has sent to the chief of the Expedition an ancient book, in which it is recorded that 300 years ago, during the reign of Soufian Khan, the Oxus, passing under the walls of Kunia-Urgenj, flowed into the Caspian near the Balkan Hills, where the Orsal Turkomans lived, who now dwell along the middle course of the Oxus. The previous examination by the Russians in 1876–7 had shown that the inclination of the land along the Laudan towards the Uzboi is almost double that of the present river in the direction of the Aral, and that only an inconsiderable portion of the waters of the Oxus (one-eighth) is yearly expended in irrigation, the greater portion being spent in the unproductive overflow of its delta, and emptied into the Aral. This confirms the opinion of those who are in favour of an immediate diversion of the Oxus into the Uzboi, by way of experiment, without waiting for the completion of the scientific examination.

Distribution of the Afghan Tribes about Candahar.—While engaged on duty in February 1879, between Kelát-i-Ghilzai and Candahar, and afterwards in the Arghisán Valley, Lieutenant R. C. Temple, B.S.C., collected some information respecting the population of the villages passed, which he has communicated to the Bengal Asiatic Society.† Nearly all the Afghans living in the Candahar district, he says, are Duránis of the Pópalzai and Bárakzai sections. Of these the Pópalzais mainly occupy the valley of the Tarnak as far as Shahr-i-Saffa, and the Bárakzais the whole valley of the Arghisán to Márúf. Beyond Shahr-i-Saffa (now merely a ruined mound), as far as Jaldak in the Tarnak Valley, the Alikózai section of the Duránis is found; the Ghilzais not being seen till the neighbourhood of Kelát-i-Ghilzai is reached. Near Candahar there is one small Kakur village, named Malang, and the Mómands also have a large village there. There is a considerable colony of Ghilzais of the Taraki section about six miles distant; Sayads are found scattered about as in other parts of Afghanistan; and lastly, colonies of one section are found here and there in the country of another. Near Candahar villages of mixed populations are common, but further up the valleys they are not often met with. Lieutenant Temple calls attention to the difficulty of discovering the name of a village, as it may have six different names given to it by guides; those thoroughly acquainted with the locality would recognise it by any one, while others only know it by some of them. Thus a village may be called (1) after the district, (2) after the section of the tribe which inhabits it, (3) after the subdivision, (4) after its late owner, if only recently dead, (5) after its present owner, and (6) by its own name. Complicated as this system of nomenclature appears, Lieutenant Temple points out that it is natural enough in a country where the individual occupies such an important part in men's minds, and nationality so little; it is not difficult to deal with in practice, after a slight knowledge of the country is acquired, but it accounts for the great apparent discrepancy in names and distances met with on maps and in routes. In concluding his notes, Lieutenant Temple makes some remarks on the names Khojak Pass, Rogháni Range, and Khója Amrán Range, found on the maps as representing the celebrated hills dividing the Pishin and Kadanei valleys. Locally these names are unknown as designating any set or range of hills; in fact, neither the Achakzais nor the inhabitants of the Pishin (Tor Taríns) have any general name for the hills, but every peak, spring, and stream has a special local name, often but little known. Khójak is the name of the river, the bed of which forms the pass; Rogháni is the name of the pass so called, not of any hill; while Khója (or more properly Khwája) Amrán is the name of a peak in the Gwája Pass, on the summit of which there is a cemetery, and Lieutenant Temple thinks it possible that Khwája Amrán was a Pír, or saint, when alive.*

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* For an account of the organisation of this expedition, see 'Proceedings,' vol. i. p. 342.

† 'Journal, Part I., No. III., 1879.

Mr. George King's Journey in Western China. — Mr. George King has sent home to the China Inland Mission some particulars of a journey which he has made across the mountainous tract of country between Chung-king-fu, the great commercial mart in Szechuen, and Tsin-chow-fu, the most southern prefecture in the Kansu province, a region which has rarely, if ever, been traversed by Europeans. From Chung-king Mr. King went northwards to Pao-ning-fu, along a road for the most part paved and which ascended the hills by steps. Some excellent masonry was seen in the large bridges on the way as well as in the stone balustrades which line the unprotected side of the road on some of the steep mountain-sides near Chung-king. From Pao-ning-fu to Kwang-yüan, the last city in Szechuen, a lofty range of mountains had to be crossed, the roads at high elevations being found fairly good, but there were two long and toilsome ascents and descents. The view from the summit at each end of the range was extensive, but when Mr. King ascended from the Pao-ning side, the fog lay thick in the valley, and nothing could be seen but the peaks of the lower hills, which seemed like islands in a sea of driven snow. A few miles of the journey were performed by boat on the "Little River," as the Kia-ling is locally called. It certainly, however, appears to deserve a more distinctive appellation, as it is navigable for some 2000 *li* (over 600 miles), from Pei-shui-kiang, in Kansu, to Chung-king, where it enters the Yang-tsze-kiang. As with other rivers depending largely on the mountain snows for their water, it is very low in the latter part of the summer and the autumn, but in the early summer its waters are very high. Mr. King found Lio-yang-hsien (Lo-yang on the maps), on the Shensi side of the river, in a very dilapidated state and the city wall in ruins. The cause of this was that just beyond Lio-yang the Kia-ling enters a narrow gorge in the mountains, and when the water rises rapidly it has not room to discharge itself and overflows the neighbouring country. The roads about the corner of Shensi through which Mr. King passed are bad, but much trouble has been expended on them in some parts by the Chinese. At low water the road follows the bed of the mountain streams, but at high water this is of course impossible. To meet the difficulty, a double row of holes was chiselled out of the solid rock on the mountain side, in the upper of which stone or wooden beams were placed running out horizontally, while strong supports ran obliquely up to those which rested in the lower row; the road was made on the upper beams, but now little of it remains.

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* See also 'Proceedings,' vol. i. p. 713.

Internal Communication in Japan.—In continuation of the previous note on this subject (vol. i. p. 209), it is interesting to know that the Japanese are taking steps to improve the means of communication in, and thereby develop the resources of an important portion of the main island. A railway was already in existence between Kobe, near the eastern end of the Inland Sea, and Kioto; and Her Majesty's Consul for Hiogo and Osaka, in his newly published report for 1878, notes with satisfaction the commencement of an extension of this line from Kioto to Otsu. On this line there will be a tunnel half a mile long, which is expected to be finished early in the present year. The line will run down to Lake Biwa, and along the shore between the lake and the town of Otsu; and there are to be wharves, &c., for the use of vessels trading on the lake. The line, as a rule, is of a light and inexpensive character, but the gradients are steep, owing to the nature of the country. The only bridge of any magnitude is that over the Kamagawa at Kioto, consisting of eight spans crossed by wrought-iron girders, each 50 feet in length. This bridge, the tunnel through Osaka Yama, and some heavy earthwork near that mountain constitute the principal engineering features of the line. From another source we learn that the Japanese Government have lately determined to continue this line northwards from Otsu, at the head of Lake Biwa, to Tsuruga, a town in the province of Echizen at the head of a large bay on the coast of the Sea of Japan. Should this work be carried out a large extent of rich country will be opened to commerce.

Dutch Exploration in New Guinea.—Under the title of 'Reizen naar Nederlandsch Nieuw-Guinea,' the Royal Institute of Netherlands India at the Hague has recently published an important work embodying the reports of the scientific missions conducted between 1871 and 1876 by MM. P. van der Crab, J. E. Teysmann, J. G. Coorengel, A. J. Langeveldt van Hemert, and P. Swaan, with geographical and historical notes and appendices by M. Robidé van der Aa, of which a brief notice was given at the end of our last volume (p. 813). In order to make the geographical, ethnographical, and philological information, which this work contains, accessible to the world at large, M. Meyners d'Estrey has announced his attention of basing on it and other publications of the Royal Institute of Netherlands India, a work to which he proposes to give the title of 'La Papouasie ou Nouvelle Guinée Occidentale et ses Habitants.' This work will be preceded by a somewhat elaborate introduction, and the first chapter will deal with the political geography of, and historical researches concerning New Guinea; and these are stated to be ready for the press. The other chapters will deal with the following subjects respectively:—Ternate, Tidore, Batjan, and Gebe; the Papuan Islands at the north-west of New Guinea; the islands in Great Geelvink Bay; the countries bordering on Geelvink Bay; Telok Lintjon; Humboldt and Sadipi bays; countries between Geelvink Bay and Galliwo Strait; Nottan, the north-western part of New Guinea; Telok Beran; McCluer Inlet; the Peninsula of Onin; the Kowiai country; the Kapia and Timoraka or Timakowa countries; Prince Frederic Henry Island and the southern coast of New Guinea; Geology; and Languages.

The Maritime Alps.—In the February number of the 'Alpine Journal,' its editor, Mr. Douglas Freshfield, calls attention to a strange error with regard to the highest summit of the Maritime Alps. The government map of Piedmont (1 : 50,000) is primarily responsible for this mistake, which has found its way not only into general atlases, but also into the new official French maps. In all these the Cima di Mercantoura is set down as the highest, or one of the highest, summits of the Maritime Alps, and is placed (sometimes with a height of 10,390 feet) immediately east of the pass leading from the Baths of Valdieri to S. Martino Lantosca. In reality no peak exists in this situation. The insignificant elevation east of the pass, known in the country as the Cima di Mercantoura, has recently been measured by the Italian Staff in the course of their new survey, and shown to reach only 9105 feet, or barely 700 feet above the pass. The only geographers who have hitherto escaped from the general blunder of making a mountain out of a molehill, appear to be Mr. Ball, who, in his lists of peaks in the 'Alpine Guide' and 'Encyclopædia Britannica,' rightly ignores the Mercantoura; and M. Burnat, a Swiss botanist, who in 1878 published in the 'Echo des Alpes' of Geneva a note pointing out the true state of the case. The highest peak of the Maritime Alps, according to the new Italian Survey —the unpublished results of which have been communicated to Mr. Freshfield—is the Rocca dell' Argentera, 10,795 feet. It must be borne in mind that Mr. Freshfield, in company with M. Burnat, maintains on scientific grounds that the Col de l'Argentière is the proper north-western limit of this range, and consequently excludes all summits beyond it.

The Berlin Society of Commercial Geography, established only a year ago, now counts 1500 members. It publishes a weekly journal, 'The Export,' containing trade reports from distant countries, and a bi-monthly periodical of more scientific character, the 'Geographische Nachrichten,' the original articles of which are often illustrated by maps. A map by Dr. Lange, of the coast region of Loango (north of the Congo), in the part for last November, may be cited as a favourable specimen, forming a valuable contribution to the cartography of this portion of the coast, which was explored by Dr. Güssfeldt, under the auspices of the German African Society. One of the most important objects of this vigorous new Society is the promotion of German interests, especially commercial interests, in distant countries, to aid in which a system of branch Societies and foreign correspondents is being established. Thus six affiliated Societies have been founded in Brazil, one in Sydney, and so forth. The Society holds periodical meetings, at which papers are read.

Danish Exploration in Greenland.—M. Komerup, who, as we mentioned last August (vol. i. p. 520), accompanied Lieutenants Jensen and Hammer in their scientific investigations as geologist, reports having met an extraordinary and at present unexplained phenomenon. He states that in the course of his explorations, in the ice-fields of the interior he ascended a hill, the top of which was covered with flowers and vegetation, several kinds of small animals being also found there.

American Interoceanic-Canal Surveys.—Although undertaken so long ago as 1875, the results of the United States Expeditions under Commander E. P. Lull, U.S.N., and Lieutenant F. Collins, U.S.N., for the examination of routes for a ship canal through the American Isthmus, have only recently been published (as a Government Report at Washington). Commander Lull's expedition was divided into two parties, one, under Lieutenant Leutzé, surveying the Chagres River with the object of finding the best position for the viaduct (or rather aqueduct) by which it was proposed to carry a waterway across the Chagres River; and the other, under Lieutenant Colby, simultaneously exploring the course from that point to Panamá. The chief himself made a reconnaissance of the Bayano River, which he dismisses as incapable of being utilised for the purpose of interoceanic communication. The work of both parties was satisfactorily accomplished, in spite of great natural obstacles; and a route finally selected for the proposed canal, which is very much the same in general features as the Plan No. 6 of Lieutenant Wyse.* Starting from Limon or Navy Bay, it follows the western side of the Panamá railway for a short distance, crossing to the eastern side at Gatun, and so continuing (except at one or two bends) all the way to the great bend of the Chagres River at Matachin, which it is to cross by the aqueduct above mentioned. It is proposed to obtain the necessary supply of water at this elevation for carrying the canal through the ridge to the Pacific slope, by damming the upper waters of the Chagres 12 miles to the north-east, to a height of 12 feet in a place where the approximation of the steep-sided rock walls of its valley renders such a project feasible; and to convey the artificial surplus by another aqueduct about 10 miles long, and through seven tunnels, to a receiving basin at Obispo also made by damming. The total length of the main canal slightly exceeds 41 miles, and it is to have thirteen locks in the Pacific, and twelve in the Atlantic division; and the whole cost is estimated at nearly 19,000,000*l*., being over 1,000,000*l*. less than Wyse's plan, and with twenty-five locks as against the 10 miles of tunnel of that scheme.—Lieutenant Collins was employed in surveying the valleys of the Napipi and Doguado rivers in the State of Cauca, Colombia, with the like object of finding a fit locality for an interoceanic ship-canal. Commencing at the first northern bend of the Napipi, he endeavoured to find a straight passage to the Atrato; but the swampy nature of the soil and the hilliness of the intervening country rendered it impossible to do more than follow the river closely. Surveys were also made at the junction of the Merindo and Napipi, for a projected dam and basin to be fed by the Cuia. Various accidental circumstances put a premature end to this expedition; but Lieutenant Collins enters into particulars as to the construction and course of the canal which he advocates, practically the same as that proposed by Commander Selfridge. It is to follow the left bank of the Napipi to its junction with the Doguado; there to cross by means of the dam above mentioned, and then to follow the right bank of the Doguado, pass the dividing ridge by a tunnel 3½ miles long, and come out in the valley of the Chiri-Chiri, with ten locks, necessary for reaching the Pacific in the bay of the same name, twelve locks having also been required for reaching the ridge from the Atlantic. The Napipi, Doguado, and Chiri-Chiri will have to be diverted frequently from their natural courses. The total estimated cost is nearly 740,000*l*. more than Lull's Chagres route.

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* See 'Proceedings,' vol. i. p. 408.

CORRESPONDENCE.

The Boundaries of Ecuador.

THE eastern boundary of Ecuador, as part of the old Spanish domain in South America, was arranged between Spain and Portugal at the time of the treaty of San Ildefonso; most authorities therefore agree on this point: but regarding the northern and southern limits all differ.

In Stieler's Atlas the southern frontier runs from a point 60 to 70 miles up the River Chinchipe, about due north-east, till it reaches 78° 30′ longitude, whence it continues in an east by north direction to a point due north of Pebas; here it bends about east by south to the longitude of Tabatinga, which neither on this map, nor on any of the general atlases that I have seen, is quite in accordance with the position determined by the Brazilian Commission (viz. long. 26° 46′ 24″ W. of Rio; lat. 4° 14′ 30″ S.). From here, as before mentioned, the line runs due north, crossing the Putumayo, Japurá, and Uaupés to 1° 30′ N. lat., whence, in a curved south-west direction, it again returns to the Japurá in long. 72° 50′; runs up that river a little over another degree of longitude, and then, crossing the equator at an acute angle, gradually bending more northward, reaches the longitude of Pasto in lat. 50′ N.

Villavicencio, whose map of Ecuador is as regards the country west of the Andes, I believe, as correct as it is unreliable in its eastern parts, gives, as the boundary claimed by the Government of Ecuador, a line running from Jaen, near the confluence of the Chinchipe and Marañon, in a south-east direction across the Huallaga, a little north of Tarapoto, and then east up to the Ucayali, whence it continues north-east, and follows the Javarí up to the Marañon.

Notwithstanding the asserted claims of his Government, Villavicencio gives as his own opinion of what the southern limit should be, to suit the claims of both Peru and Ecuador, the main stream of the Marañon down to a spot opposite the mouth of the Javarí, which, be it remarked, is on his map wrongly placed in relation to Tabatinga. On the north he draws a line from the eastern slope of the Andes, north-east of Pasto, midway between the Putumayo and the Caquetá down to 2° 10′ S. lat., in the same longitude as the southern boundary, viz. the mouth of the Javarí. The longitudinal line connecting these two eastern extremities he gives as the "boundary with Brazil according to the treaty of San Ildefonso in 1777." As with the southern, so also with the northern limit of Ecuador, Villavicencio traces a frontier demarkation, which in his own opinion should be adopted, by simply running a line equidistant between the Napo and Putumayo, thus excluding the latter river entirely in favour of Colombia.

In Keith Johnston's Atlas the southern boundary is the same as that proposed by Villavicencio, but a small triangular piece is cut off between 4° and 5° S. lat. from the Chinchipe to the Marañon. In the north and east, however, enormous additions are made; especially in the latter direction, where the frontier is bulged out to long. 68° 20′ W., and takes in some 120 miles more of the north bank of the Marañon. What probably in part throws the boundary so far eastward on this map is the different position of the Caquetá and other rivers; but until the courses of these are determined it is impossible to say who is correct and who is not.

But the territories in present actual possession of Ecuador do not correspond with the extreme claims of the Government mentioned by Villavicencio, nor this geographer's more moderate boundaries; and still less the wider limits on the north-east corner given in Stieler's and Johnston's Atlases. The following are the limits as they stand, as far as I am able, from practical knowledge, to make out.

On the north-east the Government authorities of Ecuador have for some time past recognised the Coca and Napo as their frontier with New Granada, but the latter country seems to have come to no definite arrangement with Peru as to its limits on the left bank of this river. A settlement called Cayaposa, a little higher up than the River Masan, and on the opposite bank, is generally looked upon as the frontier, and the Peruvians nominate an authority there, but the same individual, and others, have had at least the offer of a similar post from the Colombians. On the right bank the little River Masan is recognised by Ecuador as its frontier with Peru, but the latter republic has pretensions, ostensibly based on some old treaty, to the Napo "as far as it is navigable." On the Pastassa, and the neighbouring northern affluents of the Marañon, the Peruvians have pushed forward on every possible occasion, and at one time there was a Peruvian priest, nominated by a Peruvian bishop, as far up as Andoas. This elicited some protests from Ecuador, but the apathy and ignorance of this Government in respect of its Province "del Oriente" are so complete, that it can cause no surprise to others to see encroachments gaining upon their territory year after year, and the rich and gold-teeming province becoming more and more lost to them.

Much interesting information on the affluents of the Marañon proper will doubtless be contained in the reports and maps of the Peruvian survey under Admiral Tucker, when these are published.

The remarks I have offered have of necessity been very incomplete, as I have been unable to submit to a comparative examination many maps which include portions of the subject discussed, such as Ponce de Leon's map of the Cauca, and the excellent Brazilian map of the Amazon Province. If, however, my observations should be the means of inducing others to correct and complete them, I should consider that much had been gained.

ALFRED SIMSON.

REPORT OF THE EVENING MEETINGS, SESSION 1879–80.

Fifth Meeting, 26th January, 1880.—Lord HOUGHTON in the Chair.

ELECTIONS.—*Stephen Nelson Braithwaite, Esq.; Major Sidney Thomas Bridgford*, R.M.A.; *Thomas Christy, Esq.; Hugo Harpur Crewe, Esq.; John Dixon, Esq.*, C.E.; *John Merrick Head, Esq.; William Leyland Hunter, Esq.; Siegmund Loewe, Esq.; Charles James Palmer, Esq.; Martin Stratford, Esq.; Eugene Stock, Esq.; Samuel Stubbs, Esq.; Laurence A. Wainwright, Esq.; William Watson, Esq.*

The paper of the evening was as follows:—

"A Journey through Central South Africa, from the Diamond Fields to the Upper Zambesi." By Dr. Emil Holub.

The author was introduced to the Meeting by the Chairman, and prefaced his paper by a few introductory remarks relating to the motives which induced him to travel in South Africa, and his earlier experiences in the colony before undertaking his last and greatest exploration. (*Ante*, p. 166.)

Sixth Meeting, 9th February, 1880.—The Right Honourable the Earl of Northbrook, G.C.S.I., President, in the Chair.

Presentations.—*Navig.-Lieut. C. W. Baillie*, R.N.; *Samuel Stubbs, Esq.*

Elections.—Honorary Corresponding Member, Colonel C. G. Gordon, R.E., C.B.

Fellows.—*Elijah Barber, Esq.; Harry Stratford Caldecott, Esq.; Joseph C. Dimsdale, Esq.; John Gavin, Esq.; Joseph Henry Goodhart, Esq.; N. A. Jephson, Esq.; Gervais Mathews, Esq.; A. B. Moorhead, Esq.; Emile Rocker, Esq.; Philip Lutley Sclater, Esq.*, F.R.S.; *Alfred John Smith, Esq.*

The President drew attention to the announcement that Colonel C. G. Gordon had been elected an Honorary Corresponding Member of the Society, which evidently met with the approval of the Fellows. It certainly was a great honour to have such a man connected with the Society. He had been officially connected with Colonel Gordon some years ago, and although the present was not the time or occasion on which to enter into any account of his services, he might say that among all the men whom he had ever known or heard of, no one had fulfilled whatever duty he was entrusted with more honestly, more conscientiously, more straightforwardly, or with greater courage and higher Christian principle than Colonel Gordon. He was a man who throughout his life had never been afraid to say to those under whom he acted, the precise truth as to what he believed to be best for the public service, whether his opinions were popular or unpopular, or whether they were likely to be to his own advantage or not. Although for the time he had left the service of Egypt, it was his (the President's) sincere wish that the great abilities, high character, and peculiar qualifications of Colonel Gordon might not be long left unemployed in the service of his country.

The President then introduced to the Meeting General Sir Michael A. Biddulph, who proceeded to read his paper on "The Eastern Border of Pishin and the Basin of the Loras, in Afghanistan."

The paper and discussion which followed will be published in the April number.

PROCEEDINGS OF FOREIGN SOCIETIES.

Geographical Society of Paris.—January 23rd, 1880: M. A. Grandidier in the Chair.—The following gentlemen were announced as having been chosen to form the Central Committee of the Society for the year:—*President*, M. A. Grandidier; *Vice-Presidents*, MM. Hamy and Adrien Germain; *General Secretary*, M. Ch. Maunoir; *Assistant Secretary*, M. Thoulet. M. E. Cortambert was unanimously elected Honorary President of the Central Committee.—A letter was read from M. Senereau, dated from Aden, November 15th, 1879, in which he stated that he had just returned to that place, after a voyage of a month's duration to the opposite coast of Africa—Zeila, Berbera, Tajurra, and Obock. He was expecting soon to be able to start for Shoa, where, making a fresh starting-point from Ankober, he would explore Guargué, Enarea, Kaffa, and the Galla country, and endeavour to reach the Sobat.—It was announced that M. de Brazza had reached Madeira, in good health, on his way to the Gaboon.—Dr. J. Crevaux then read his second paper on his recent journeys in South America. He dwelt upon the future prospects of the tropical regions of that continent, maintaining that it was not in the search for gold and precious stones, but in profiting by the products of the forests that their chances of prosperity lay. Vast forests of magnificent trees on the Maroni and the Oyapok at present were crumbling uncared for to decay. Besides the sarsaparilla plant, the Bertholetia nut tree, and the indiarubber trees, which were utilised to some extent on the Lower Yary, there were the carapa, yielding a useful oil, which grows on the borders of all the Guiana rivers, the copaüba, and a large number of trees yielding, when deeply cut, aromatic oils. The want of population was the great difficulty. The white race supports the climate with difficulty, and Hindoo coolies not much better; but negroes and Chinese succeed perfectly. In conclusion, the author discussed the vexed question of boundaries between Brazil and the French possessions. The Brazilians claimed the territory as far as the Oyapok, on the ground that they had found at the mouth of this river, on the Montagne d'Argent, a boundary stone marked with the arms of Charles V.; but a special mixed commission appointed to examine this stone, failed to detect the figure of a crown upon it, and Dr. Crevaux had himself found that similar sculptured stones existed far in the territories of Dutch and British Guiana.—A paper was afterwards read on his travels in Mexico, by M. Maler.

Geographical Society of Berlin.—February 7th, 1880: Dr. NACHTIGAL, President, in the Chair.—After the conclusion of the preliminary business, the President congratulated Dr. Gerhard Rohlfs (who was present) on his safe return from Africa, and then proceeded to make various communications to the Meeting. First among these was a detailed report from Dr. Oscar Lenz. This traveller, as is well known, undertook some years ago, at the request of the German African Society, the exploration of the region of the Lower Ogowé. He has now, by direction of the same Society, started for Morocco, in order to explore the Atlas Range of that country. From Tangier he has already made several excursions to Tetuan and Arcila, and on the 22nd December, 1879, he started in the company of Hadj Ali, a nephew of the celebrated Abd-el-Kader, for Fez, where he arrived on the 31st of the same month. An account of his journey is to appear in the next number of the 'Mittheilungen' of the African Society.—The President next read a letter received from Count Széchényi, dated 10th August, 1879, from Si-ning-fu, in the province of Kansu. The Count writes as follows:—"Accept my best thanks for sending in my report to the Tsungli Yamên (Chinese Foreign Office). As early as the 11th July I received a reply here. Considering that my report left Su-chow on the 16th April, that it travelled to Peking by Shanghai and Tientsin, where it had to be translated and presented; that the Tsungli Yamên forwarded their reply to Tso Tsun Tan at Su-chow, who again sent it on to Si-ning, and that the whole transaction only occupied thirty-seven days, one cannot but entertain, in view of the enormous distances, a high opinion of the efficiency of the present postal arrangements in the Chinese Empire. Since my last letter I have travelled over a large tract of country. Proceeding by the Kia-yu-kuan Pass I arrived at Au-si-tun and Tung-kuan-hien, which is built on the site of Sa-chu-vei (the Saciu of Marco Polo). From there I made excursions as far as the 94th meridian (Greenwich). I reached Si-ning-fu on the 24th June. Here I found the temperature agreeably cool, and even at times too cold after the extreme heat endured during the previous days, when we had to march daily from eight to eleven hours over the burning sand and stones of the steppe. The horses were hardly able to walk, and so I and both my travelling companions, the Hungarian geologist Loézy and the Austrian topographer Kreitner, were obliged to accomplish more than half of the journey on foot. The latter suffered much from his exertions, and his strength was at last so far reduced, that he had to be dragged over the terrible mountain paths in a cart. All my excursions from Si-ning-fu were made in the company of Loézy: towards the north in the direction of Sing-chüen and Tatung-hien (we also visited the Tibetan Lama monasteries of Altin and Chobzen); towards the south as far as Kumbum and Kvei Te on the right bank of the Hoang-ho; towards the west to Tonkir and the Koko-nor. Each of these excursions occupied from ten to fourteen days, on account of the enormous distances. During our absence Kreitner worked diligently at the charts, and determined the position of several places. The Chinese surveys proved to be inaccurate, for example, Si-ning-fu and the Koko-nor will have to be placed much more towards the east. Our journals contain many new and interesting entries, as most of the places where we have been have never before been visited by a European. Everywhere, as soon as we made our appearance, we were surrounded by a dense inquisitive crowd, which followed us for miles on our journeys. The Mandarins show us much hospitality, and do all they can for us, considering their limited powers. Si-ning-fu is prettily situated in a broad valley not far from the Hoang-ho. The air is pure, the water good, and there is an abundant supply of milk, butter, meat, and fresh vegetables. Rice, however, is our principal food. After wandering for seven months we saw here the first pine forests, with luxurious underwood scattered over the northern mountain slopes. Grass is found growing at a height of 13,000 feet above the sea-level, where yaks, goats, and even the horses of the Tangutes find nourishment, &c."—Under date of the 2nd September, 1879, the German Ambassador in China reported to the Foreign Office, Berlin, that according to a communication from the Tsungli Yamên, Count Széchényi had started on the 12th August from Si-ning-fu, and continued his journey towards Tibet by Lanchaow-fu, Chin-chow-fu and Ta-chiën-lu, in the province of Szêchuen. According to a second report from the Ambassador, dated 27th November, the traveller is stated to have arrived at Cheng-tu, the capital of the province of Szêchuen, at the beginning of October. The journey from Si-ning-fu to that place had taken forty-five days. The Governor-General of Szêchuen had raised objections to the further progress of the Count, but the latter had firmly resolved to start on the 8th October, and hoped by taking the road viâ Ta-chiën-lu and Litang to reach in forty days the town of Batang, situated on the boundary of Tibet,* where he intends to wait for a favourable opportunity to cross the frontier. The conferences which have taken place at Peking between the Imperial Austrian Resident Minister and the Tsungli Yamên on the subject of the Count's further progress, have led to no change in the state of affairs, as the Tsungli Yamên did not wish to absolutely prohibit the continuation of the journey, and even sent orders to the Chinese Resident at Lhassa to provide for the safety of the traveller in Tibet; on the other hand, it drew attention to the dangers to which the Count would expose himself by entering Tibet. That such dangers exist may be gathered from a postscript to the above letter, dated Peking, 2nd December, which says: "According to a report just forwarded to the Tsungli Yamên by the Governor-General of Szêchuen, and dated the 8th November, Count Széchényi had arrived in perfect health at Ta-chiën-lu on the 24th October. Here the Chinese endeavoured to dissuade him from continuing his journey, but he decidedly refused to give up his project, although the Chinese contrived to enlist the services of a Catholic missionary stationed in that place, in order to induce the Count to turn back. The Governor-General reports that the Tibetans are assembling their troops, and that nothing is talked of on the highways and in the bazaars but the audacious traveller upon whose head the Tibetans had already put a price. The Governor-General promises the official who is able to bring the traveller in safety across the Tibetan frontier, that it will be considered as "a meritorious act of the first class."—Baron Richthofen reported having heard from Captain Gill, the Chinese traveller, that according to a letter addressed to the latter by the English Consul Baber at Chung-king-fu (province of Szêchuen), Count Széchényi had passed on the 18th November through Hŏ-kóu, where he had crossed the River

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* We have previously announced this, from another source of information. *Vide* Proceedings,' vol. i., December number, p. 792.

Yalu-Kiang about two days' journey to the westward of Ta-chiĕn-lu. At Chung-king-fu there was a rumour that seven Russians, who had lost their way near the Koko-nor, had arrived at Si-ning-fu. Perhaps these travellers are Prejevalski and his companions.—Dr. Gerhard Rohlfs next described his journey to the Oases of Kufra, and the circumstances which compelled him to return to Benghasi.—Finally, Dr. Schumacher, formerly Consul-General of Germany at Bogotà, made some remarks on Francisco de Caldas, the natural historian and geographer of New Granada.

Geographical Society of Leipzig.—January 14th, 1880: Professor ZIRKEL, President, in the Chair.—Dr. E. Credner, of the University of Halle, gave a lecture "On the Geographical Features of Siberia, and their importance as affecting the commercial intercourse between that country and Europe," treating of the latest discoveries and achievements of the Swedish Arctic Expedition.—An address was delivered by Dr. K. Brugman on the present state of our knowledge regarding the relationship between the different Indo-Germanic peoples. Taking language as his guide for classification, he established for the whole race eight main divisions, viz. Aryan, Armenian, Greek, Albanian, Italian, Celtic, Germanic, and Balto-Sclavonian. He considered the question, however, as not yet finally settled.

Geographical Society of the Netherlands. — Twenty-eighth General Meeting, Rotterdam, February 14th: Col. VERSTEEG in the Chair (in the absence, through illness, of the President, Professor Veth).—Pu Raden Mas Adipati Ario Chondro Negoro, Regent of Kudus, in Java, was elected Honorary Member. This intelligent chief has written in Javanese a popular account of his travels through most Residencies of Java, and in Dutch, of which language he is thoroughly master, a series of critical observations on Professor Veth's work on Java. These will before long be published in the Journal of the Society. A paper was read by Mr. W. T. C. van Laak, of Arnhem, on the origin, history, plan, and purpose of the Oriental Museum (Orientalisches Museum) at Vienna, giving an account also of the treasures it contains. This paper was heard with the more interest, as the Netherlands Society for the Encouragement of Industry has made some advances towards the establishment of a similar collection, viz. a Commercial Museum, but has met with a good deal of objections to the expediency and practicability of the plan. A discussion on the merits of this plan was the natural consequence of the paper of Mr. van Laak, and ended in a resolution that the foundation of the Commercial Museum was recommended by the Geographical Society, and would receive its moral support to the utmost of its powers.—A second paper was read by Mr. R. van Eck, a missionary resident for some years in the island of Bali, on the history, geography, language, and literature of this island. At present Mr. van Eck is Teacher of the Geography and Ethnology of Netherlands India in the Military College at Breda; and he has published, among other works, a Balinese Dictionary. Beginning with drawing a parallel between Bali and Java, Mr. van Eck proceeded to show how much the maps of the smaller island are still incomplete and faulty, and gave a sketch of its coasts and ports, its rivers and mountains. He gave also an account of the population (about 800,000 in number), its origin, and division into natives and a foreign element from Java known by the name of "men of Modjopahit," of the castes still existing in the island, and how much their abolition would be desirable. Lastly, he showed how much the study of Bali may lead to a better knowledge of Java and its original institutions. In a temple at Boleleng in Bali is still preserved a copy of a summary of ancient Javanese laws respecting the regulation of village communities and irrigations, sent down directly from Modjopahit to a vassal in Bali, and transmitted as a holy relic to posterity. By these ancient laws, according to Mr. van Eck, much light is thrown on the difficult questions regarding the property of the soil, the sale and pawning of ricefields, and the contracts for labour, which have recently so much engaged the attention of the Dutch authorities in Java.—A paper was read by Mr. Kuyper, of the Hague, on the labours of the section of the Netherlands Geographical Society charged with the promotion of the knowledge of the home country. He stated that the next number of the Journal of the Society would contain a map of the canals of the Netherlands.

NEW BOOKS.

(By E. C. Rye, *Librarian* R.G.S.)

EUROPE.

Bernier, Théodore.—Dictionnaire Géographique, Historique, Archéologique, Biographique et Bibliographique du Hainaut. Mons (Manceaux): 1879, 12mo. pp. 640.

After a chapter on the historical topography of the province, the various communes, towns and rivers, &c., are discussed in alphabetical order, chiefly with respect to their archæological interest.

Diefenbach, L.—Völkerkunde Osteneuropas, insbesondere der Haemoshalbinsel und der unteren Donaugebiete. Erster Band: Türkisches Reich, Albanesen, Illyrier, Thraken, Griechen, Rumänen. Darmstadt (Brill): 1880, 8vo., pp. 318. (*Williams & Norgate:* price 6s.)

ASIA.

Anderson, A. Hay.—Notes of a Journey to the Auriferous Quartz Regions of Southern India, with facts relating thereto. Edinburgh and London (Blackwood): 1880, 12mo., pp. 16, price 3*d.*

Cameron, V. L.—Our future Highway. London (Macmillan): 1880: 2 vols., sm. 8vo., pp. 313 & 342, map, pls., price 1*l.* 1*s.*

An account of the author's experiences during a journey from Beirut to Karachi, by the usual Tigris route, undertaken with the object of becoming personally acquainted with the line of possible railway communication between the Persian Gulf and the Mediterranean. The map (190 miles to the inch) includes Asia Minor and the Western Frontier of the Indian Empire.

Conybeare, H. C. A.—Note on Pargana Dudhí of the Mirzápur District, with special reference to its Land Assessment. Allahabad (North-Western Provinces and Oudh Government Press): 1879, fo., pp. 65, maps.

Contains a geographical and descriptive account of the country, with notes on its climate, inhabitants (and their language and superstitions), fauna and flora, especially as regards economic objects. A general history follows. The map, showing reserved forests, is on the scale of 4 miles to the inch.

Cotteau, E.—Promenade dans l'Inde et à Ceylan. Paris (Plon): 1880, 12mo., pp. 432, map. (*Williams & Norgate:* price 3*s.* 6*d.*)

Delaporte, L.—Voyage au Cambodge. L'Architecture Khmer. Paris (Delagrave): 1880, large 8vo., pp. 462, pls., map. (*Williams & Norgate:* price 17*s.*)

The author (who visited Siam and Cambodia in 1865, and took part in the subsequent Mekong Mission of Lagrée), was sent out by the French Government in 1873, as head of an expedition of which the object was the discovery and transportation of Khmer monuments. The distribution of these in Southern Indo-China is shown upon a map; and the text contains an account of Lieut. Delaporte's researches, with descriptions of his chief discoveries. There are 175 engravings, of which 50 are from photographs; and, although the book is almost entirely archæological, the extraordinary nature of the sculptures figured, and the evidences afforded by them of a widely extended and highly cultivated former race, will ensure its place, as a supplement to Garnier's more pretentious account of Lagrée's explorations, among such works as those of Layard and Squier.

Gill, W.—The River of Golden Sand. The Narrative of a Journey through China and Eastern Tibet to Burmah. With an introductory Essay by Colonel Henry Yule, C.B., R.E. London (Murray): 1880, 8vo., 2 vols., pp. 420 & 453, maps, illustrations, Index, price 1*l.* 10*s.*

The main features of Captain Gill's journeys are given in Vol. xlviii. of the 'Journal of the R. G. S.,' p. 57 *et seq.* They are practically divisible into six sections, of which Itineraries (with dates, altitudes, mileage, and day's work) are given in an Appendix. These sections are:—(1) his Northern Journey in the Pe-Chi-Li province. Starting from Tien-Tsin on the Pei-Ho on 20 September, 1876, the author, after visiting Peking, reached the Great Wall (finding the Palisade barrier of our maps non-existent), and the deserted city of Ning-Hai at its sea terminus, returning to Peking and Tien-Tsin. The highest point reached was the Ta-Liang Tzŭ Pass, 2010 feet. (2) 680 miles on the Yang-Tzŭ-Chiang,—adhering to the orthography employed,—from Shanghai to Hankow by steam vessel, in company with Mr. Baber, with whom Captain Gill arrived at Ch'ang-Ch'ing after a boat journey (3) from Hankow of 844 miles. (4) From Ch'ung-Ch'ing to Ch'êng-Tu, 246 miles, and from the latter city (5) northwards to Li-Fan-Fu and Sung-P'an-T'ing, returning to it by Lung-An-Fu and Mien Chou, 487 miles, the author travelled alone. (6) His last and longest journey, from Ch'êng-Tu to Bhamo, 1110 miles, occupying nearly four months, was undertaken in company with Mr. Mesney, a gentleman of long service under the Chinese Government. Leaving Ch'êng-Tu on July 10, he struck in a south-westerly direction to Ch'ing-Chi, thence turning north-west to Ta-Chien-Lu, entering the Tibetan marches by the Cheh-Toh-Shan Pass (14,515 feet) of the Yung-ling range. His course then lay westwards in a country of considerable elevation (varying from 9,222 feet to 16,568 feet) to Bat'ang, the cross range of the Surong Mountains being passed by the Nga-Ra-La-Ka Pass (15,753 feet); and from Bat'ang he turned south and south-east to Tali-fu, re-entering China by the Tsa-Leh-La-Ka Pass (15,788 feet). The furthest point westwards on Tibetan ground was Kia-Ne-Tyin (which is five miles from Tibet Proper, according to the author), near which village a large armed force, some hundreds strong, was gathered to oppose any attempt to reach Lassa. From Tali-fu he reached Bhamo viâ Yung-Chang, Momien, and Manwyne.

The scientific particulars of the author's journeys will be found in the 'Journal of the R. G. S.' above referred to, which may be taken in connection with the personal narrative here given, wherein the reader will find a mine of details upon the scenery, formation, and products of the vast extent of country traversed, and the social, political, and religious proclivities of its people. Considerable attention is also given to historical matters, Captain Gill losing no opportunity of comparing modern conditions with the state of events recorded by Marco Polo. His observations also on the status of the French Missions will doubtless be received with great interest.

Colonel Yule prefaces the narrative with a valuable introductory essay on our knowledge of the geography and hydrography of Eastern Tibet; and it is illustrated by ten route maps from Captain Gill's surveys, with a general map of the whole region, and some plates.

Malleson, G. B.—Herat: the Granary and Garden of Central Asia. London (Allen): 1880, 8vo., pp. 196, Index, map, price 8*s.*

The author has collected material from reliable sources bearing on the geography and topography of the western Afghanistan frontier, especially as to routes available for military purposes. The argument of his book is that Herât, though so far in advance of Kandahar, is effectually protected from any flank attack by the physical conditions of the country. The map (Stanford: scale 100 miles to the inch, and also with Russian verst scale) takes in from the west coast of the Caspian to Chinese Tibet, and from Peshawur to the Amu Delta.

Pina, A. de.—Deux Ans dans le Pays des Épices (Iles de la Sonde). Paris (Quantin): 1880, 12mo., pp. 323. (*Dulau*: price 2*s.* 6*d.*)

Count de Pina (who gives no date), visited Java, Sumatra, and Nias, the most interesting portion of his work referring to his stay in the second of those islands. A chapter is added on the Malaisian customs and Lingua franca.

AMERICA.

Chile.—Sinópsis Estadística de Chile. 1878-1879. Santiago de Chile (Imprenta Nacional): 1879, 8vo., pp. 31, 33, & 31.

A concise account in English, Spanish, and French, of the geographical position, physical aspect, industrial zones, population, administration, &c., of the country, with economic and other statistics to date, and a short historical sketch.

Hesse-Wartegg, Ernst von.—Nord-Amerika, seine Städte und Naturwunder, sein Land und seine Leute. Leipzig (Weigel): 4to., Bd. ii. pp. 242, Bd. iii. pp. 262, 1879, Bd. iv. pp. 82, 1880. (*Asher*: price of the whole work, 1*l.* 5*s.*)

The completion of the work of which the first vol. was mentioned in our 'Proceedings' for 1879, p. 78.

Lull, E. P., & Collins, F.—Reports of Explorations and Surveys for the location of Interoceanic Ship-canals through the Isthmus of Panama, and by the Valley of the River Napipi, by U.S. Naval Expeditions, 1875. Washington (Government Printing Office): 1879, 4to., pp. 124, maps and sections 1–4, 1–9.

This Official Report (44th Congress, Ex. Dec. No. 75) contains the Journals of the two expeditions referred to in 'Geographical Notes' *supra*, with full details of the respective projects as to mechanical construction, cost, &c. The maps are—of the country between Aspinwall and Panama (scale nearly 1½ mile to the inch), and of the Atrato, Napipi, and Doguado region, based on Selfridge's survey, with added topography, in two sheets (scale 600 yards to the inch); profiles, sections, and other engineering diagrams are also given.

Lista, Ramon.—La Patagonia Austral (Complemento del 'Viaje al pais de los Tehuelches'). Buenos Aires (Libreria Europea): 1879, 8vo., pp. 105, map, illustrations.

A continuation of the author's work above mentioned (see 'Proc. R. G. S.,' 1879, p. 479), which described his personal experiences, this supplement being devoted to a condensation of the chief scientific and historical observations on the country and its inhabitants. He announces a Geographical Description of the Argentine Republic (to be specially devoted to the Patagonian portion, as claimed by his Government, down to the Magallanes Straits), and a Geological Study of Southern Patagonia. The present work, after a summary of former explorations in that region, contains a sketch of its general aspect, hydrography and orography; short accounts of the Chilian Colony of Punta Arenas, San Julian, &c.; outlines of the chief faunistic and botanical features (with some little detail), meteorological observations, and more extended notes on ethnological subjects.

A supplement to the author's Tehuelche vocabulary is given, and the work concludes with an account of the "Kitchen-middens" of Puerto Deseado and of flint instruments and other archæological objects found on the Rio Chico, &c. The map gives a sketch of the affluents of that river, and there are views of Punta Arenas (from a photograph) and the great salt pan of San Julian, some other cuts being devoted to anthropological subjects.

ARCTIC.

Nordenskiöld, A. E.—Sur la possibilité de la Navigation Commerciale dans la Mer Glaciale de Sibérie. Stockholme (Norstedt): 1879, 8vo., pp. 36, maps.

This translation into French (by J. H. Kramer) of a memoir written on board the *Vega*, during her winter north of Behring Strait, and submitted by Professor Nordenskiöld to H.M. the King of Sweden, describes the routes (1) from the North Cape to the embouchure of the Obi and Yenisei, (2) between the Yenisei and the Lena, and (3) between the Lena Mouth and Behring Strait, with a general view of the North-east passage. The experiences of all former travellers are reviewed in connection with this subject; and the author comes to the conclusions (1) that a sea passage from the Atlantic to the Pacific along the North coast of Siberia, is capable of being often made in a few weeks with proper steam power, but that it is scarcely probable, judging from the present knowledge of the Siberian glacial sea, that this route should, as a whole, become of any important effect for commercial purposes; (2) that there are no difficulties in the way of utilising for commerce the sea road between the Obi and Yenisei and Europe; (3) that in all probability the sea route between the Yenisei and Lena, and between the Lena and Europe, can be equally utilised for commercial purposes; but that a journey to and fro between the Lena and Europe cannot be made in one summer; and (4) that further explorations are necessary to decide on the possibility of commercial relations between the Lena and the Pacific. It is, however, possible to introduce in steamers from the Pacific side heavy machinery and other goods not conveniently carried by the usual methods of communication by land.

In summing up the events of his own voyage, Professor Nordenskiöld considers the final stoppage of the *Vega* by ice on 28th September was an accident which could have been avoided, as United States ships have found a passage as late as the 12th and 22nd of October, and if a rapid passage alone had been his object, he could, after being caught by the ice, have reached clear water by using full steam power. He also shows how much time was lost unnecessarily in the early part of his expedition.

GENERAL.

Cailleaux, T.—Pays Atlantiques décrits par Homère. Ibérie, Gaule, Bretagne, Archipels, Amérique. Théorie Nouvelle. Paris (Maisonneuve): 1879, 8vo., pp. 485. (*Dulau*: price 6*s.*)

Lawson, W.—Manual of Modern Geography: Physical, Political, and Commercial. London and Glasgow (Collins): 1879, 12mo., pp. 448, maps, woodcuts, Index, price 3*s.* 6*d.*

This volume of Collins's "School Series" is chiefly remarkable for the number of coloured maps contained in it, rendering reference to an atlas unnecessary for ordinary scholastic purposes.

Lewis, E. W.—Physical Geography. A series of facts and theories arranged upon the basis of questions set at the Oxford and Cambridge local Examinations. London (Moffatt and Paige): 1880, 12mo., pp. 88.

Wettstein, H.—Die Strömungen des Festen, Flüssigen und Gasförmigen, und ihre Bedeutung für Geologie, Astronomie, Klimatologie und Meteorologie. Zürich (Wurster): 1880, 8vo., pp. 406, maps. (*Dulau*: price 8*s.*)

This contribution to our knowledge of the primary causes of great physical phenomena affecting the formation, &c., of the earth's surface, discusses the causation of currents in solid, liquid, and atmospheric materials, with the effect upon them of solar gravitation, eruptive forces, terrestrial magnetism, and other known agents. The subjects of geological climate and oceanic and aerial currents receive special attention. The book is well illustrated by several coloured and clearly executed maps and diagrams.

NEW MAPS.

(By J. Coles, *Map Curator* R.G.S.)

WORLD.

Hassenstein, B.—Verzeichniss der Karten in Petermann's Geographischen Mittheilungen. Zur Feier des 25 jährigen Bestehens der 'Geographischen Mittheilungen' zusamengestellt von B. Hassenstein im Januar 1880. (*Dulau.*)

EUROPE.

Artaria and Co.—Die Oesterr. u. Ungar. Eisenbahnender Gegenwart u. der Zukunft. Scale 1 : 2,310,000, or 30 geographical miles to an inch. Artaria & Co., Vienna 1880. 1*s.* 6*d.* (*Dulau.*)

This is one of a series of Railway maps published by Artaria & Co. of Vienna. All the railways at present in operation, under construction and proposed are clearly laid down, and lists are given of those which belong to the State as distinguished from the lines of private companies.

Austrian Government.—Administrativ-Karte von Nieder-Oesterreich. Herausgegeben vom Vereine für Landeskunde. Scale 1 : 28,800 or 2·5 inches to a geographical mile. Sheet 10. Harbach; 15 Geras. Artaria & Co., Vienna. Each sheet 1*s.* 9*d.* (*Dulau.*)

—— Specialkarte der Oesterreichisch-Ungarischen Monarchie im Masstabe 1:75,000 der Natur (or 1 geographical mile to an inch). 1880. Price of each sheet 1*s.* 4*d.* (*Dulau.*)

The following sheets of this map are just published:—Zone 5, Column XIII; Zone 6, Column XVII; Zone 7, Columns XV, XVIII, XXII; Zone 8, Columns XVIII, XXII; Zone 9, Columns XIV, XVI, XXI, XXIV; Zone 10, Columns XXIII, XXVI; Zone 22, Column VIII; Zone 23, Column VIII.

Corps d'État-Major.—Carte de France dresseé par le Corps d'État-Major au 1 : 80,000 (or 1 geographical mile to an inch); édition zincographique révisée. Liv. I. 4*s.* (*Dulau.*)

This revise of the map of France, published at the Dépôt de la Guerre, will be issued in monthly parts, each part containing sixteen quarter sheets.

—— Carte de France dressée par le Corps d'État Major au 1 : 80,000 (or 1 geographical mile to an inch); édition sur cuivre. No. 261. Bastia. 4*s.* (*Dulau.*)

Dépôt de la Guerre.—Carte de la France et des pays voisins pour l'étude de la géographie physique et militaire par le Command. Niox. 2me édition, revue et complétée 1880. One sheet, printed in four colours. 6*s.* (*Dulau.*)

Lan, Louis.—Plan topographique de la Commune de Marseille et des communes environnantes, dressé et publié par L^{s.} Lan, Chef du bureau des Travaux publics à la Mairie, Membre lauréat de la Société de Géographie de Marseille, 1879. Scale 1 : 20,000 or 3·6 inches to a geographical mile. Gravé par Erhard, Paris. 4 sheets.

This map, which is published under the patronage of the Geographical Society of Marseilles (for the compilation of which M. Louis Lan received the silver medal of that Society), is a coloured lithograph. The Communes belonging to the Arrondissements of Marseilles and Aix are distinguished from each other by pink and green borders respectively; and the hill work (which is very effective) has the different heights above sea-level clearly indicated in figures. The plan of the city of Marseilles itself is on a sufficiently large scale to give a very good general idea of the position of the principal buildings, docks, railway stations, &c. All means of communication, including the canals, are clearly laid down, the names of each being given. Anyone who desires to become better acquainted with the country in the immediate neighbourhood of Marseilles, could scarcely do better than study this map.

Prussian General Staff.—Generalstabs-Karte d. Preussischen Staates. Scale 1 : 100,000 or 1·3 geographical mile to an inch. No. 61, Bereut; 78, Bublitz; 138, Schloppe; 139, Schneidemühl; 225, J. Göttingen; 259, Eschwege. (*Dulau.*)

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GEOLOGICAL SURVEY MAPS.

1-inch Scale:—

England, No. 97 S.E., price 3*s.*

6-inch Scale:—

England, Northumberland, No. 91, price 6*s.* (*Stanford, agent.*)

ASIA.

Intelligence Branch, Quartermaster-General's Department.—Map of the country round Cabul. Surveyed by Major Garden and Captain Paton, Quartermaster-General's Department, in the month of August, 1839. Scale 1 : 72,000 or 0·8 geographical mile to an inch.

Intelligence Branch, Quartermaster-General's Department.—Reconnaissance Sketch of Kabul and its environs made in 1842. By Captain F. Abbott, Bengal Engineers. Scale 1:15,840 or 4 inches to a mile. Intelligence Branch, Quartermaster-General's Department, 1879.

The Sherpur Cantonments have been added to this map by the Intelligence Branch of the Quartermaster-General's Department.

Petermann's 'Geographische Mittheilungen.'—Karte von einem Theil des Sanpo-Flusses in Tibet aufgenommen von N-m-g, einem Indier bei der Indischen Landesvermessung, 1878. Scale 1:1,600,000 or 21·7 geographical miles to an inch. Petermann's 'Geographische Mittheilungen.' Jahrgang 1880, Tafel 2. Justus Perthes, Gotha 1880. (*Dulau.*)

Smith, Lieut C. H. M.—Panorama of Kabul from camp Sia Sung. Drawn by Lieut. C. H. M. Smith, D.A.Q.M.G., Kabul, 21st Oct. 1879. Photozincographed at the Surveyor-General's Office, Calcutta, November 1879. Ordnance Survey Office, Southampton, 1880.

AFRICA.

Kiepert, Richard.—Dr. C. B. Klunzinger's Routen um Qosêir in Aegypten. Nach seinen Aufnahmen zusammengestellt mit den Karten von E. Gottberg, R. Lepsius & H. Kiepert und der englischen Küstenkarte von Richard Kiepert. Scale 1 : 500,000 or 6·8 geographical miles to an inch. Dietrich Reimer, Berlin, 1879. (*Dulau.*)

AMERICA.

Geological Survey of Canada:—

Map of part of the East Coast of Hudson's Bay, from a track-survey by Dr. R. Bell. 1877. Scale 1 : 250,000 or 3·4 geographical miles to an inch.

Geological Map of part of Cape Breton, Nova Scotia, by Hugh Fletcher, B.A. 1879. Scale 1:63,000, or 1·1 inch to a geographical mile.

Map of Nelson River and the boat-route between Lake Winnipeg and Hudson's Bay, from the track-surveys by Dr. R. Bell. 1878. Scale 1:500,000, or 6·8 geographical miles to an inch. Containing an inset plan of the Mouth of Hayes' River, and Vicinity of York Factory.

Map of Lake Winnipeg to accompany Dr. Bell's Report for 1878. Scale 1:500,000, or 6·8 geographical miles to an inch.

These four maps accompany the Report of Progress of the Geological Survey of Canada for 1877–78. Published by Authority of Parliament. Montreal, 1879.

Petermann's 'Geographische Mittheilungen.'—Der Staat Antioquia in Colombia. Reducirt von den Originalkarten von C. S. de Grieff und Villavéces, mit Ergänzungen v. R. B. White u. F. v. Shenck. Scale 1 : 850,000 or 11·5 geographical miles to an inch. J. Perthes, Gotha, 1880. Petermann's 'Geographische Mittheilungen,' Jahrgang 1880, Tafel 3. (*Dulau.*)

Surveyor-General of Canada.—Map of part of the North-West Territory, including the Province of Manitoba. Showing an approximate classification of the Lands. Scale 1 : 3,500,000 or 47·6 geographical miles to an inch. Compiled and drawn by J. Johnston, Chief Draftsman, Dominion Lands Office, Ottawa, 1st March, 1878. Preliminary Edition.

——— Map showing the Townships surveyed in the Province of Manitoba and North-West Territory in the Dominion of Canada. Published by order of the Hon. David Mills, Minister of the Interior, Feb. 15th, 1878. Scale 1 : 390,000 or 5·2 geographical miles to an inch. J. Johnston, Chief Draftsman, Department of the Interior, Dominion Lands Branch.

Wells, James W.—Planta Geral da Estrada de Ferro d. Pedro II. e das outras Estradas de Ferro das Provincias do Rio de Janeiro, S. Paulo e Minas-Geraes do Imperio do Brazil. Organisada pela administração da mesma Estrada de Ferro d. Pedro II. Scale 1 : 1,000,000, or 13·6 geographical miles to an inch. Angelo and Robin, Rio de Janeiro, 1879.

This map has been compiled by Mr. James W. Wells for the purpose of showing the existing state of Railway communication in the Provinces of Rio de Janeiro, São Paulo, Minas-Geraes and adjoining Provinces. The railways have been laid down from the actual plans on which they were constructed, and a great part of the map has been reconstructed from the modern surveys made under the direction of the Brazilian Geodesical Commission. In addition to the Railways at present in operation, the lines under construction, and proposed, are given, as well as a table of the distances from Rio de Janeiro, and heights of each station above the sea-level. To those who are interested in the development of the resources of the Empire of Brazil, the proposed extension of the existing Railway system (which is very clearly laid down) will be viewed with interest, extending as it does to Porto de Stn. Anna on the Rio Parannahyba, the towns of Lavras, St. Luzia, Pomba in the Province of Minas-Geraes, and St. Eduardo, in the Province of Espirito Santo; while another proposed line of Railway crosses the Province of São Paulo from the present termini, to a point at the junction of the rivers Parana-panema and Pardo. In a map embracing so large an area of a country, much of which has never been surveyed, some errors must occur, but as much of the country was personally known to Mr. Wells, who has had considerable experience as a surveyor, it is probable that this map is (of its scale) the best that has yet been given to the public, of this portion of the Empire of Brazil, and as a specimen of cartography, does great credit to the publishers, Messrs. Angelo and Robin, of Rio de Janeiro. The map is accompanied by a pamphlet which contains a large amount of statistical information with reference to all the lines of Railway in Brazil, which are now working, as well as those which are being constructed.

ASIATIC ARCHIPELAGO.

Petermann's 'Geographische Mittheilungen.'—Originalkarte des Mittleren Sumatra zur Übersicht der Wissenschaftlichen Expedition 1877 bis 1879. Mit Benutzung der Aufnahmen von Schouw Santvoort, Cornelissen und Makkink gezeichnet von D. D. Veth, Mitglied der Expedition. Scale 1 : 1,000,000 or 13·6 geographical miles to an inch. Petermann's 'Geographische Mittheilungen,' Jahrgang 1880, Tafel 1. Justus Perthes, Gotha, 1880. (*Dulau.*)

CHARTS.

Admiralty.—Charts published by the Hydrographic Department, Admiralty, in November and December 1879.

No.	Size.		Inches.	
2619	m	=	1·5	Australia, south coast:—King George Sound and Princess Royal harbour. Price 2*s*.
1038	m	=	3·0	Australia, west coast:—Warnbro sound. Price 1*s*. 6*d*.
648	m	=	0·1	Africa, east coast:—Delagoa bay to Masangzani bay (plans, Sofala river, Inhambane river). Price 2*s*. 6*d*.
874	m	=	3·0	Japan, Tsu Sima:—Ajiro bay, Itsuhara and Asu harbours. Price 1*s*.
896	m	=	0·28	Africa, west coast:—Donkin bay to Milkbosch point (plans, Hondeklip and Roodewall bays). Price 2*s*. 6*d*.
1771	m	=	2·9	South Atlantic Ocean:—St. Helena Island. Price 2*s*. 6*d*.
457	m	=	1·9	Japan:—Aburatani harbour. Price 1*s*.
873	m	=	0·17	Liu Kiu Islands:—Oö-sima group (plans, Naze harbour; Oö-sima strait). Price 1*s*. 6*d*.

No.	Size.		Inches.	
1037	m	=	1·87	Australia, west coast:—Hamelin bay, Flindens bay Price 1*s*. 6*d*.
57	m	=	5·25	India, West Coast:—Rajapur bay and Viziadurg harbour. Price 2*s*. 6*d*.
875	m m m	= = =	0·28 1·30 1·45	Cochin China, Tong-King gulf: Delta of the Song-Ka, Pak-Hoi anchorage, Guie-Chau island. Price 1*s*. 6*d*.

CHARTS CANCELLED.

No.		Cancelled by	No.
2619	King George sound	New plan, King George sound and Princess Royal harbour	2619
647	Inhambane river	New chart, Delagoa bay to Masangzani bay	648
648	San Sebastian Cape to Masangzana bay		
649	Sofala river and bar		
1771	St. Helena island	New plan, St. Helena island	1771
264	Sandwich bay		
57	Rajapur bay and river	New plan, Rajapur bay and Viziadurg harbour	57
58	Viziadroog or Geriah harbour		

Indian Marine Survey.—Chart No. 115 (*a*). Bay of Bengal. Seaface of the Soonderbuns. Mutlah River to the Chittagong Coast from the latest Government Surveys. Published at the Marine Survey Department, under the superintendence of Commander A. D. Taylor, I.N., Superintendent of Marine Surveys, Calcutta, Dec. 1879. Price 2*s*.

ATLASES.

Boronat y Satoire, Francisco.—España Geografica Historica Illustrada. 49 sheets 1879. Price 6*l*. 6*s*. (*Dulau.*)

This Atlas consists of 49 sheets (chromolithograph), a separate sheet being given for each Province; the scales of the Maps vary, ranging from 8 to 15 geographical miles to the inch. Each sheet contains coloured illustrations of the costumes of the inhabitants of the province, and a panoramic view of the Chief City. There are also given copious geographical and historical notes comprising statistics as to the Climate, Astronomical position, Census returns, Physical features, Mineral and Vegetable productions, Schools, Colleges, Roads, Railways, Telegraphs; together with the boundaries of Judicial Districts, and a general Historical sketch of each Province (or more correctly speaking, of that portion of Spain now comprised within the limits of each Province) from the earliest times to the present date. This is the second edition of this Atlas; the maps are clear and not overcrowded with names, while the letter-press forms a very complete Gazetteer.

Spruner, Dr. K. v.—Hand-Atlas für die Geschichte des Mittelalters und der neueren Zeit. Dritte Auflage. Neu bearbeitet von Dr. Theodor Menke. Parts 22 price 3*s*. 9*d*., and 23 price 2*s*. Price of the Atlas, complete in sheets, 4*l*. 5*s*.; cloth, 4*l*. 10*s*.; half-russia, 4*l*. 15*s*. Justus Perthes, Gotha, 1879. (*Dulau.*)

The following are the contents of the 22nd and 23rd Parts of the New Edition of Dr. K. v. Spruner's Hand-Atlas:—

22 Lieferung:—Vorbemerkungen, Seite 53–56. (No 24) Italien: No. IV. Mittleres Italien 1137–1302. Maassstab 1:1,000,000. Nebenkarten 1) Crema, Mailand, süd-östlicher Theil.—2) Piacenza, nördlicher Theil. Maassstab 1:500,000. Von Th. Menke. (No. 25.) Italien: No. V. Italien 1302–1339. Maassstab 1:3,700,000.—Nebenkarten: 1) Italien 1339–1406.—2) Italien 1406–1492. Maassstab 1:3,700,000.—3–6) Mailand—Verona—Florenz —Neapel und Umgebung. Mst. 1:74,000. Von Th. Menke. (No. 39.) Deutschland: No. IX. Nördliches Deutschland: Friesland, Sachsen, Lothringen, Hessen, Thüringen etc. gegen Anfang des XIII. Jahrhunderts.

Maassstab 1:2,000,000.—Nebenkarten: 1) Trier.—2) Erfurt.—3) Breme 4) Münster.—5) Köln.—6) Die Emsmündung und Entstehung des Dollart und 1278 sämmtlich im Mst. 1:50,000. Von K. v. Spruner, Revision von Lindner. (No. 40.) Deutschland: No. X. Südliches Deutschland: Fran Süd-Lothringen, Burgund, Schwaben, Baiern etc. gegen Anfang des X Jahrhunderts. Maassstab 1:2,000,000.—Nebenkarten: 1) Stammgebiet Staufer. Mst. 1:925,000.—2) Die Habsburgischen Stammlande. Maasss 1:200,000.—3) Plan von Strassburg. Maassstab 1:50,000. Von K. Spruner, Revision von Th. Lindner.

23. (Schluss-) Lieferung:—Titel und Inhalts-Verzeichniss zum Atlas neb Register zu den Vorbemerkungen. (No. 38.) Deutschland: No. VII Deutschland zur Zeit der Hohenstaufen und bis 1273. Mst. 1:3,700,00 Von. K. v. Spruner, Revision von. Th. Lindner. (No. 41.) Deutschlan No. XI. Deutschland von Rudolph von Habsburg bis Maximilian I. 1273 b 1492. Mst. 1:3,700,000.—Nebenkarten: 1) Deutschland um 1376. Mst 1:10,600,000.—2) Das Reich Karl's des Kühnen. Mst. 1:6,000,000.—3 Schlacht auf dem Marchfelde 26 Aug. 1278. Mst. 1:370,000.—4) Schlach bei Göllheim, 2 Juli 1298.—5) Schlacht bei Mühldorf, 28 September 1322.— 6) Schlacht bei Granson, 2 März 1476.—7) Schlacht bei Murten, 22 Juni 147 8) Schlacht bei Nancy, 5 Januar 1477. Sämmtlich Mst. 1:185,000. Von K von Spruner, Revision von Th. Lindner.

Lieferung 23 brings to its conclusion the third edition of Dr. K. v. Spruner' Hand-Atlas, which, under the supervision of Dr. Theodor Menke, was commence in 1871, and which has therefore taken nine years to complete. To the studen of History this Atlas must prove invaluable; for not only are the maps beautifully executed, and most carefully compiled, but each map has its explanator notes in the letter-press. The number of maps in the present (the third edition, are greatly in excess of those given in the second; being 90 principa and 394 inset maps, as against 80 principal and 119 inset maps. The Atlas i furnished with an Index; and the general arrangement of the maps is a follows:—Europe, 13 principal and 11 inset maps, commencing in the middl of the fifth and ending in middle of the nineteenth century: Iberian Peninsula, 7 principal and 16 inset maps, commencing in the seventh century and endin 1870: Italy, 8 principal and 50 inset maps: Merovingian and Carlovingia periods, 2 principal and 15 inset maps: Germany, 20 principal and 103 inse maps: France, 7 principal and 23 inset maps: Great Britain, 5 principal and 28 inset maps: Scandinavia, 4 principal and 19 inset maps: Sclavonia, 6 principal and 44 inset maps: Hungary, 3 principal and 22 inset maps: The Orient, 15 principal and 63 inset maps. Taken as a whole, this Historical Atlas is, without doubt, the best that has been published, and though such an Atlas as this cannot fail to be of great service to every student of History, yet, as all the explanatory notes are published in German it is more especially suited to those who have at least a partial knowledge of that language.

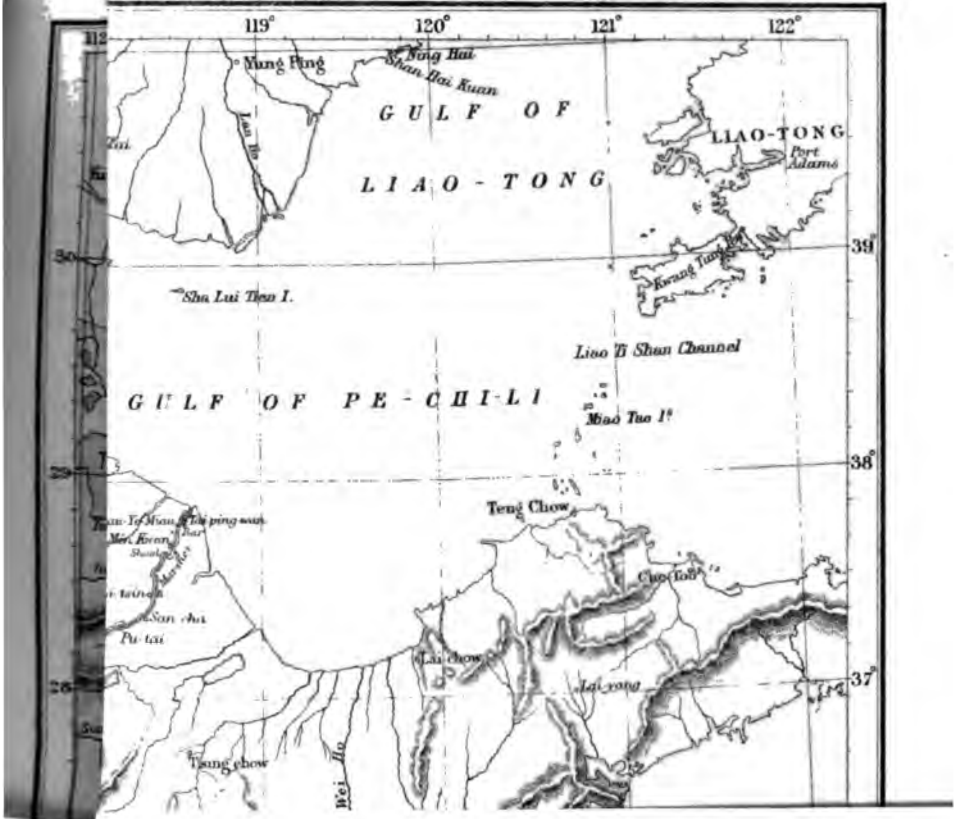
Stieler, Adolf.—Hand-Atlas über alle Theile der Erde, neu bearbeitet von Dr. August Petermann, Dr. Hermann Berghaus und Carl Vogel. Parts 11 and 12. Price 2*s*. each. Justus Perthes, Gotha, 1879 and 1880. (*Stanford.*)

The following are the contents of the 11th and 12th Parts of the New Edition of Stieler's Hand-Atlas:—

Part 11:—No. 5. Die sichtbare Seite der Mondoberfläche. No. 37. Frankreich, Bl. 4. Südost-Frankreich. Von C. Vogel. 1:1,500,000. No. 39. Spanische Halbinsel. Blatt 1. Nordwestlicher Theil. Von C. Vogel. 1:1,500,000.

Part 12:—No. 13. Das Mittelländische Meer und Nord-Afrika. Westliches Blatt. Von A. Petermann. 1 : 7,500,000. Nebenkarten: Die Maltesischen Inseln 1 : 500,000; Gibraltar, 1 : 150,000. No. 30. Italien. Übersicht. Von A. Petermann. 1 : 3,700,000. Nebenkarten: Rom und die Campagna 1 : 500,000; Turin und Umgebung 1 : 500,000; Der Etna und seine Umgebung 1 : 500,000. No. 59. Nord- und Mittel-Asien, Übersicht des Russischen Reiches. Von A. Petermann. 1 : 20,000,000.

ON, M. I. C. E., 1878.


119°
120°
121°
122°
Yung Ping
Ning Hai
Shan Hai Kuan
GULF OF
LIAO-TONG
LIAO-TONG
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Lan Ho
Kwang Tung
39°
Sha Lui Tien I.
Liao Ti Shan Channel
GULF OF PE-CHI-LI
Miao Tao Is
38°
Teng Chow
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Pu tai
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Tsang chow
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PROCEEDINGS

OF THE

OYAL GEOGRAPHICAL SOCIETY

AND MONTHLY RECORD OF GEOGRAPHY.

rogress of the East African Expedition; Mr. Thomson's Report on his journey from Lake Nyassa to Lake Tanganyika.

following letter from Mr. Thomson, commanding the Society's t African Expedition, was received, viâ Mozambique, on the 4th of rch, and read at the Evening Meeting of the 8th :—

Pambete, Lake Tanganyika,
9th November, 1879.

have much pleasure in announcing the safe arrival of the Society's edition at the above place on the 5th, having reached the Lake on the 4th.

e have met with no accidents and few difficulties, though since arrival here I have been prostrated by fever which has rendered ncapable of any work, much to my disappointment, as I had hoped ke advantage of the arrival of Mr. Stewart of Livingstonia, to send a sketch map and an account of my route. Mr. Stewart arrived e afternoon of the 5th, and leaves to-morrow morning, and as I am excessively weak from the effects of the fever, I can only offer a very meagre remarks, which I am afraid will be far from satisfactory.

he country of Konde (misnamed Uchungu by Elton), from which we our start, lies at the north-west corner of Lake Nyassa, and occupies p triangular indentation in the central plateau, the escarpment of h, rising to a height of from 6000 to 8000 feet, bounds it on all sides pt the east. Near the lake extends a broad plain of wonderful lity, with a large population.. Proceeding north-west we leave the and cross a gently undulating ground covered with trees, and ed by the Jumbaka. When we get to the height of 3000 feet we an extremely broken and ridgy country, forming excellent grazing , but having few trees, and not well suited for cultivation.

he country of Konde is drained by three considerable rivers,—the a, which drains through the Ukinga Mountains from near Mazote's

High Pass; 2nd, the Jumbaka, which runs nearly parallel with the Lufira, but in the lower grounds; and the Lukuviro, which enters Nyassa south of the Great Elephant Marsh. The number of feeders of this stream draining from Usafa in a small space is wonderful. In an hour we have crossed six streams, two of them being of considerable volume. The people of Konde are all Wakinga, having emigrated from that mountain region owing to internal dissensions. Uchungu, as Mr. Stewart will soon make appear, lies to the south of Konde. The most westerly limit of Konde I place in long. 33° 45′ E., and in lat. 9° 22′. From this point the extremely steep face of the plateau commences, and we ascend from an altitude of 3300 to 6500 feet in the country of Nyika. The first two stages take us over highlands with an average height of about 7000 feet, forming good grazing ground, and well wooded in many parts. The highest point reached was on the Munboya Mountains, a range running about W.N.W. and E.S.E., on the top of which the barometer showed a height of 8180 feet.

From these mountains the ground descends through barren woodland with few fertile spots till long. 32° 45′ is reached, where the altitude is only 3300 feet. The whole of that part of Nyika through which our route lay is extremely broken, sustaining a very scant population, which has a few goats and in some places cattle. There is very little cultivation. The people, however, are a most courageous race, and certainly the most arrogant. There is, however, no cohesion amongst them, and each little headman of a village has to fight his own battle with Merere's raiders who constantly harass the country. To the west Nyika is bounded by the Chingambo Mountains, which running north and south, rise from 3300 to 5000 feet with a steep easterly face, but sloping gradually away to the west. These mountains are in long. 32° 45′ E., and the lat. is about 9° 5′. There was but one stream deserving the name crossed by the Expedition, the others being mere rivulets, one or two draining to the Lukuviro, a few south, and the others north-west to Lake Hikwa.

Crossing the Chingambo Mountains we enter the country of Inyamwanga, a small country reigned over by a chief called Mlila, who, though he possesses few subjects, yet showed more of the potentate than any of the chiefs I have yet seen. The whole country is covered with trees, having only a few grassy open spaces. The land slopes gradually west till we reach near the boundary stream Mkaliza, which flows south in about longitude 32° 20′. We here enter the country of Mambwe, which is one of alternate grassy plain and wooded ridge, rising in altitude to a height of 5000 feet at the chief Kitimba's capital, Mulichuchu. This height is generally maintained till we reach Tanganyika through the hilly country of Ulungu, which occupies a narrow strip of country round the lake.

The northern part of Mambwe forms a great watershed for streams joining the Lofu, the Luguvu, and, if our guides are to be believed, a considerable stream called the Wawa flows to Lake Hikwa. The main interest, however, attaching to this region, is the existence of a huge spring situated in an angle of the Ulungu and Uwembe mountains, which gives rise to both the main tributaries of the Lofu and the Luguvu. The latter we crossed a quarter of a mile east of the spring, and we found it to be about five feet deep and twelve feet broad. The stream is here called the Saisa.

From such information as I have been able to collect from the natives and my own observation, I cannot but conclude that the rising of the lake is periodical. On all hands I am informed that as a rule it rises from 18 inches to two feet during the rains, and according to the amount of rainfall so does the water rise. Four years ago there was an excessive rainfall which raised the level of the lake about 10 feet, flooding Pambete, and maintaining its height for a month, and to this day the marks on the dead trees, now out of reach of the water, attest the truth of the statement. Trees standing out in the water have been cited as an argument in favour of the theory of a "gradual rise." But an examination of them shows that they have attained their present position by the washing away of the soil during these periodical risings. Further observations along the shore will help to clear up the question.

The long barometer filled by the spiral cord method was set up with all the care which Mr. Stewart and myself could command, and we had the following readings:—

Pambete 7th	.. .. ..	27·27.	Thermometer	83°
8th, at	12.30 P.M.	27·34.	„	88°
„	5 P.M.	27·28.	„	85°
9th	9 A.M.	27·40.	„	82°
„	1 P.M.	27·34.	„	83°
„	6 P.M.	27·33.	„	83°

Four boiling-point thermometers gave the following results:—

9th, 7 P.M.	No. 15007	gave	207°·75
„	„ 15111	„	207°·70
„	„ 17460	„	207°·80
„	„ 8039	„	207°·80
Thermometer			81°·5

These observations are mainly Mr. Stewart's, my fever making me unfit for any work.

To-morrow I start along the western side of the lake northwards, till I reach a good place where I may camp my men, and, taking about thirty, push on for the Lukuga creek, passing down the river about 30 miles, then striking south through the still unexplored region in that quarter, get back to camp and march for Kilwa, which I hope to reach within six months.

I may add that my protractions have brought me almost right in latitude, but about ten miles too far west in longitude, taking Livingstone's map as correct.*

J. THOMSON.

Note on Mr. Thomson's Hypsometrical Observations, by Mr. J. Coles, Map Curator, R.G.S.

The means of the heights obtained from the barometer readings, temperatures, and boiling points, taken by Mr. Thomson, are as follows:—

The mean result obtained from barometer readings and temperatures is 2610 feet above sea-level. The mean result obtained from boiling points of thermometers Nos. 17460 and 8039 (corrected for errors by Kew Certificates) is 2618 feet above sea-level.

The barometer reading for the lower station (sea-level), in calculating the above, is 29·9 inches, and the temperature used is 79° of Fahrenheit. These quantities have been obtained from 'Die Verbreitung der Wärme auf der Oberfläche der Erde, von H. W. Dove'; 'Grundzüge der Meteorologie, von H. Mohn'; and 'Handy Book of Meteorology, by Alexander Buchan.' The thermometers Nos. 15007 and 15111 are not known to me, and as they give widely different results from the other two thermometers (which I have corrected for the error given in the Kew Certificates), it is probable that they have some error, without the knowledge of which it would be impossible to obtain true results. As compared with some of the observations taken by former travellers, the results of Mr. Thomson's most nearly coincide with those of Dr. Livingstone, and differ most from those of Mr. Stanley. The following are the heights (above sea-level) assigned to Lake Tanganyika by the following travellers:—

Thomson	2610 feet. 2618·2 ,,
Livingstone	2624 ,,
Cameron	2710 ,,
Stanley	2756 ,,

The barometer referred to by Mr. Thomson is one of Captain George's, and was supplied to the Expedition by this Society.

Pishin and the Routes between India and Candahar.

By Major-General Sir MICHAEL A. BIDDULPH, R.A., K.C.B.

(Read at the Evening Meeting, February 9th, 1880.)

Map, p. 272.

1. THE VALLEY OF PISHIN AND THE BASIN OF THE LORAS.

Introduction.—The student of the physical aspect of countries may understand with what delight and enthusiasm we found ourselves at Quetta early in November 1878, on the far side of that screen of mountains which had of late years been known only to a few. We had a taste for geographical studies, and movement and exploration were, happily, in the direct path of duty. Our reading, and our experience of many mountain lands, had not prepared us for features so novel and so singular as those which met us at the outset. Before proceeding to describe our explorations, we must, at the risk of having to repeat what others have before depicted, dwell on some forms which are constantly recurring, and go far to make up every South Afghan landscape.

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* We have received the following later news of Mr. Thomson, by telegram from Dr. Kirk:—"Zanzibar, March 1st. Thomson left Ujiji sixteenth January. Returns by Uguha, Uhehe. Expected Kilwa, June. Lukuga now a torrent. Lake fallen eight feet."

To give exact ideas of scenery, it is often illustrative to describe by contrast. Thus we may observe that neither in Norway, nor in the Alps, nor in the outer Himalaya do we find anything at all approaching the vast plains and huge sterile skirts or glacis of the mountains, which are the marked feature in Southern and Western Afghanistan.

In all European systems the valleys are for the most part either V-shaped or formed like the letter U. The former character is most frequent in the outer Himalaya, and where the ranges of mountains have for countless ages been subject to the furrowing of an abundant rainfall. The U-shaped valleys are often those covered for a great portion of the year by snow. Plains are, however, the leading feature in the country we were exploring, while valleys and glens characterise the systems referred to with which we were familiar.

It was on emerging from the Bolan Pass that we first became acquainted with this new scenery. For ourselves, while disappointed at finding a want of clothing to the country and some absence of picturesque beauty, we felt that here at all events our cavalry could act as our watch and guard. We found we had liberty to move and ability to see far and wide. To the horseman, these wide open sweeps of country were everything, to the footman they presented many a dreary mile of march.

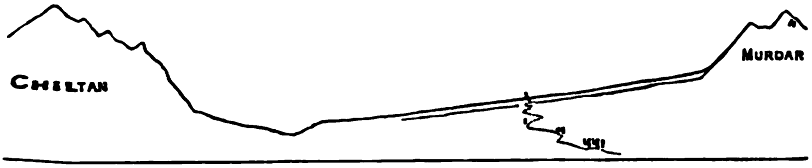

FIG. 1.—PLAIN OF DASHT-I-BEDAULAT.

The section here given fairly represents that of the vale which lies between the mountain of Murdar and Chiltán as seen from the point looking towards Sir-i-ab, where the road commences to rise from the Dasht-i-Bedaulat, and takes to the skirt of Murdar. On this glacis the road lies for 15 miles all the way to Quetta. Such skirts, composed more or less of minute debris of the mountain slope, lie at slight angles of from 5° to 12° with the horizon. The composition and pose of these uniform masses do not favour the flow of water on the surface. The springs emanating from the mountain find a passage through the soil, and are only apparent a long way down, near the termination of the slope, or in the alluvium of the lower levels of the plain. Water however is to be found, and with a rare skill, the Afghan knows how to nurse and lead the precious fluid in the *karez*, or underground channel, and apply it to fertilise those portions of the plain which are suited for cultivation, and which otherwise would remain sterile.

Another peculiarity which should be noticed before we proceed, is the abrupt character of the mountains and the opposition of their outlines to those of the plains. The lines do not run with grace one into the other. There is a weird severity of form. Ridges projecting boldly into the plains, like headlands on a sea coast, and the bareness of the plains, suggest the idea. This character is extended even to the occurrence of isolated portions of mountains, which look like islands in the sea.

Whence comes this abruptness of the mountain and strange uniform pose of the vast skirt at its base? How has this enormous mass of debris been spread out? Why do we not find remains of such formations elsewhere? Is their preservation here due to the slight rainfall? Such were the queries which occurred to us as we journeyed—points which we hope will be discussed by our more instructed fellow-students of physical geography.

We have to note here that the map furnished for our guidance at the commencement of our operations was that of Baluchistan, compiled in 1876, in the office of the Surveyor-General, Calcutta. There was also a map of Afghanistan, from the same source; both were very defective, showing that there was much to explore, and many errors to correct; both these maps were afterwards printed on cloth and distributed to the army. Major Wilson's more complete map reached us only when we arrived at Candahar. In the first stage of our proceedings we were not attended by officers of the Survey Department, and our staff was so limited in number, and so completely occupied by multifarious duties, that it was difficult to get any of our explorations properly recorded and put together. Every officer was thoroughly employed on the most pressing duties, and we were constantly on the move. Our first essays were, therefore, made under great disadvantages in this manner.

Colonel J. Browne, R.E., whom we found at Quetta, with an excellent knowledge of the localities, had prepared all the leading points of the Shalkot Ranges, such as Chiltán, Murdar, Musallugh, and Takatu, and with these plotted and taken into the field our officers found their positions by cross bearings with the prismatic compass, and the work of the several reconnaissances performed by Colonel Browne and Captains Hanna, Showers, and Harvey, and Lieutenant Smith, was compiled and plotted by Captain Hanna on our halting at the foot of the Khojak. This map of Pishin has considerable correctness as to the position of the villages and the extent and direction of the plains, but it gives but very imperfect impressions of the mountain ranges. It was printed at Lahore, and was returned for our use in January, and it formed then a valuable guide in the operations preparatory to the return march through the Kakar country.*

As we came to understand the Pishin country more perfectly, we used to liken the whole basin, including the Shalkot Loras—all its streams are Loras—to some mollusc or sea-monster. The body might be represented by the wide plains from Haikalzai to Gulistan Karez in one direction, and from Alizai to the mouth of the Gazarband in another. The arms would be the two branches of the Shalkot Lora, the Kakar Lora, the Surkhab, with two streams feeding it, and the Barshor Lora. The feelers might be represented by the Karatu, Khojak, and Gulistan (Ghwaja) Nullas. Such are the many arms of the basin we have to describe.

Framework or Boundaries.—The framework of the plains of the basin of the Lora is grafted on to a spur of the Safaid-Koh, which is itself an offshoot of the Hindu Kush. This spur has been styled the Western Suliman, and traced as a continuous marked feature. We apprehend that as we come to know more of the features in the unexplored space to the south-east of Lake Abistada we shall find that our old maps must undergo considerable modifications. With regard to this northern portion of the range, we have ourselves no information, but with that part of it which is represented as culminating in Toba Peak we have some perfectly accurate details, which we think will be found to be remarkably interesting.†

Eastern Boundary.—During the reconnaissance which was made to prepare for the movement into Pishin, it was observed that the plains of Kujlak (Khushlak) extended, as a gradually rising vale, far away to the north-east, along the western flank of the Takatu Mountain and its continuations. There was no trace of such a formation in the maps, and we were informed that no European had ever visited those parts. As soon therefore as possession had been taken of the centre of the province, a reconnaissance, under the direction of the General, accompanied by Colonel Browne, was set in motion.

The point made for was Gwal, which, resting on the slope of the Jhur Range in an open vale, lies at the exit of the old caravan road through the Sagarband defile. The range of mountains lying to the east of the vale seemed continuous, and the cleft of the defile was hardly perceptible.

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* The map accompanying this paper has been constructed from the above and the reconnaissance sheet executed by Captain Holdich, R.E. (which is a valuable and perfectly correct addition to the geography of this hitherto unexplored region), collated with Major Wilson's map of Afghanistan for the Shalkot district and the country about the upper waters of the Shorud Lora and the Bolan Pass. Captains Heaviside and Holdich, R.E., of the Survey Department, were attached to General Biddulph's column for survey operations on the march through Borai to the Derajat. Captain Heaviside was deputed to carry out the astronomical observations, and Captain Holdich the topography.—ED.

† Major Wilson leaves out the range altogether.

It was the custom in the movement of our reconnoitring columns to give no clue as to the direction in which they might move, and to this we owe in great part an absence from molestation. Thus the exploration of the Sagarband defile was at once commenced while we were on the march to take up a position at Gwal. At about a mile from the opening, a ruined tower marks the importance which the point of entry and exit possessed in the olden time. The Kakar Lora issues from the cleft a bright, clear little stream, and for a mile or so we cross and recross it, and cut off the windings, and then emerge in a more open country. We here leave the running water which comes from the south from the direction of the Sura Khwulla Pass, and then follow up the bed of a dry affluent of the Kakar Lora, and at about the sixth mile, in a direct line, from Gwal, we reach a second portal, called Gurkhai. Amira, the Malik of Gwal, is in attendance to give us information as to the localities, and this he does very intelligently.

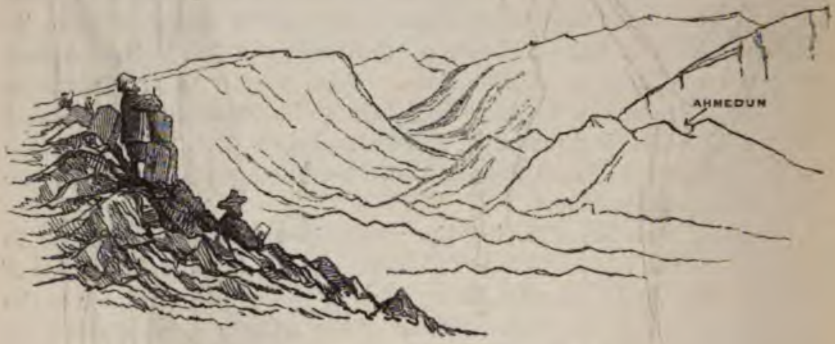

FIG. 2.—VALLEY LEADING N.E. TO MULAZIM SKOBAIE.

From the height to the south side of the Gurkhai gap we make out that we are in a country of a very broken character, of minor elevations, with the main range behind us, and Takatu end on and severed from it by the Kakar Lora; this bold promontory now appearing as an isolated and grand mass of a conical form.

Takatu we find to be joined on to Zarghun and Murdar by a low ridge (Fig. 3) in which occur two depressions, which are in order the Sura Khwulla and Hunna passes. Here, in the first pass, is the water-parting of the Shalkot water and that of the Kakar Lora we had lately followed. In the Hunna gap the waters flow on one side back to the Shalkot Lora, and on the other towards Sibi. We were approaching a country rich in water-partings. In front and to the north-east there was a sea of hummocks of a strange and confused configuration, presenting rounded surfaces of bare earth and clays of various colours. It was late, but we made out the valley stretching towards Borai, winding to the north-east, and returned to our camp at Gwal.

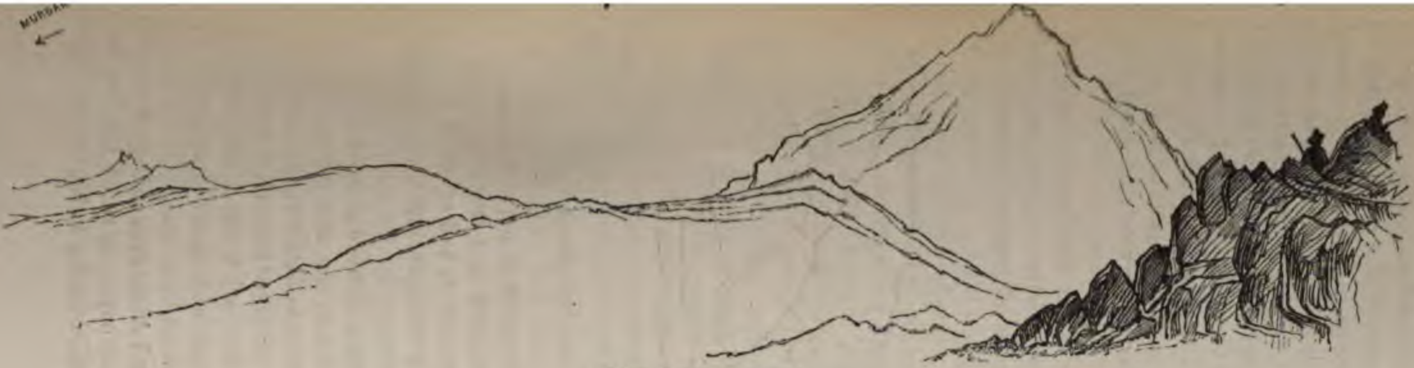

FIG. 3.—MT. TAKATU.

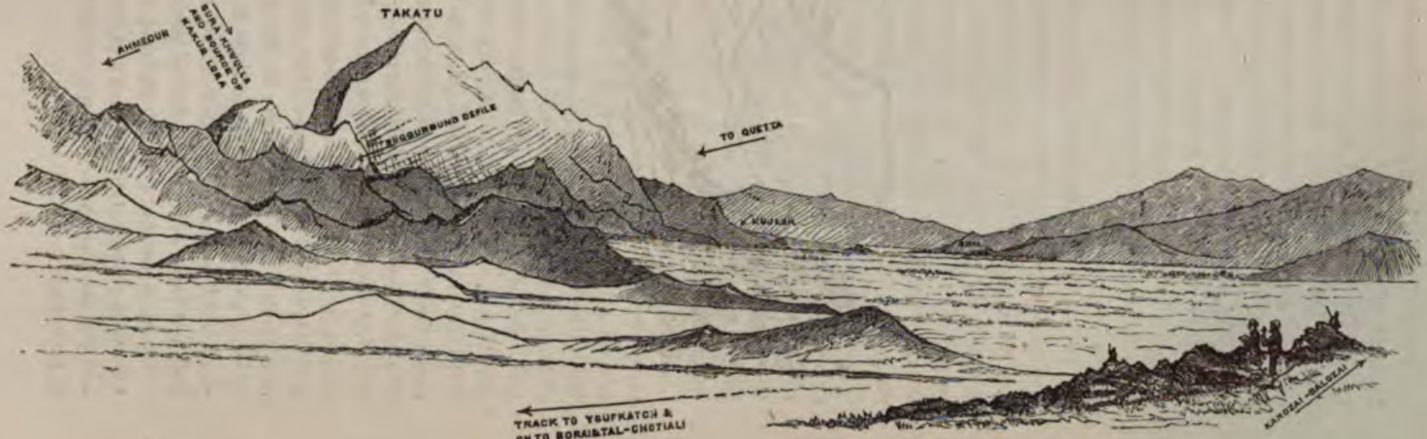
AHMEDUN
SURA KHWULLA AND SOURCE OF KAKUR LORA
TAKATU
SUGGURBUND DEFILE
TO QUETTA
KUJLAK
TRACK TO YSUFKATCH & ON TO BORAI&TAL-CHOTIALI
KANOZAI-BALOZAI

FIG. 4.—LOOKING DOWN THE VALE TOWARDS KUJLAK; SHOWING THE LENGTH OF THE PLAINS ALONG THE KAKAR BORDER.

From Gurkhai we resumed our interesting and necessary explorations the following day, and reached the Ushmughzai ridge after following up the nulla to its head, passing through the strange hummocky ground noticed the day before. The Ushmughzai is a low ridge running north-east and south-west, of easy outline and soil, and offering no great obstacle to a road. Here we reach the point where waters flow back to Pishin and on to Sibi, we are therefore on the crest of the spur which forms the eastern boundary of Pishin. Strange to say we have passed through the line of the greater elevations, and though we are in the presence of high points and ridges they are detached, and it is not easy to make out their disposition.

Direct to the eastward, across a plain called Brahiman, a beautiful mountain mass rises, which is cleft diagonally to its very base, and called Tsaroë Tungi (Fig. 7). The combined stream of drainage takes its way towards Sibi through the cleft, which also gives passage to a track said to be passable for camels. To the north-east we noticed a high ridge, which we afterwards made out to be Mazwah, and along its southern flank the valley passes, which we were informed gave a perfectly traversable road towards Smalan, Borai, Tal, and Chotiali, through Mulazim Skobaie (Fig. 2). We noted that the country skirting the Brahiman Plain trending to the north-east was open and easy to traverse, so we made a push to reach a more distant point of observation. A gallop of four miles brought us suddenly in full view of the village of Ahmedun, the head-quarters of Malik Fyzu and of the Panizai Kakars (Fig. 5).

Having come upon the village unexpectedly to the inhabitants and to ourselves, we halted, and opened communications through the good offices of our guide Amira, who is a Kakar. After some difficulty and delay, the villagers were induced to come out and talk with us, and we were able to remove any hostile feelings, if such had existed. So far, we had met with no inhabitants, and the country had a look of extreme desolation. The village of Ahmedun, disposed on a low ridge above a little stream, to which we afterwards approached, had an air of comfort and relief. Orchards and plots of cultivation mixed with the houses, and the beetling cliffs which overhung the village, and the grand outline of hills of rich colour, composed a picturesque scene which we shall long remember. Our inquiries confirmed what Amira and others had described, and it was a great satisfaction to us to find that the veracity of our guides and instructors in Kakar geography could be depended on. It was sunset, and, well satisfied with our day's work, we withdrew peaceably, to make 18 miles of intricate road back to our camp, which we reached long after night had closed on us.

Subsequently, Colonel Browne revisited Ahmedun, and was attended by Captain Holdich, R.E., who thus had an opportunity of laying down with more accuracy the topography of which we were able only to make hasty notes.

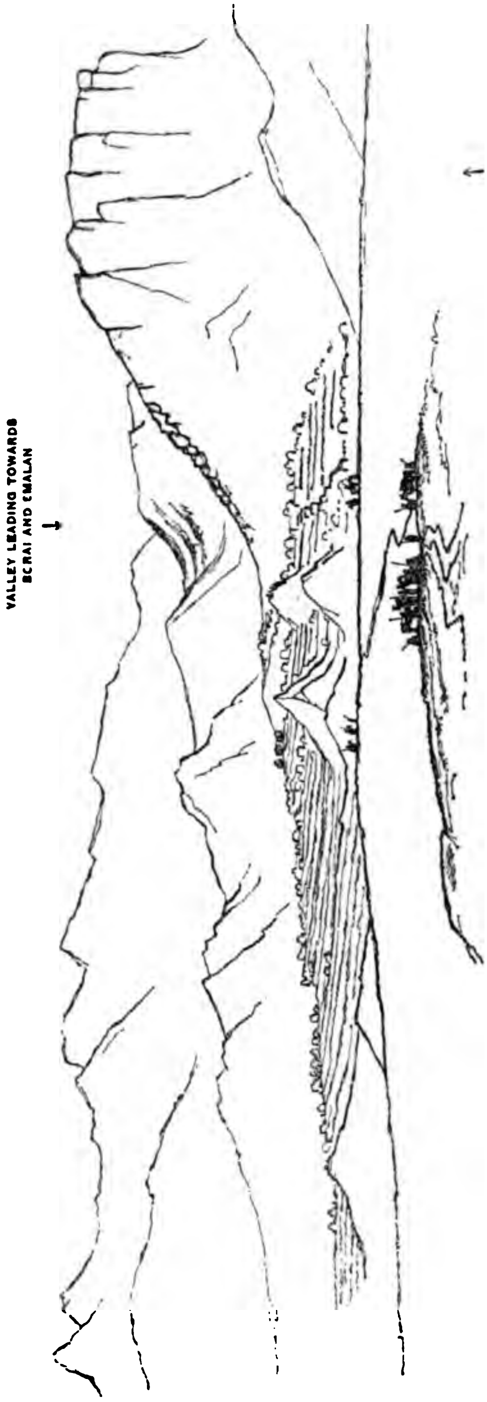
VALLEY LEADING TOWARDS SCRAI AND EMALAN
AHMEDUN

FIG. 5.—VIEW FROM THE VICINITY OF AHMEDUN.

Having thus made an important step towards the exploration of the old kafila route, and, as it were, opened the door of the Kakar country, we pursued our way along the border to the north-east, making for the villages of Khanizai (Kanozai) and Balozai.

The great features of the continuous range on our right, to the east of our track, and of constantly ascending open plain, were still prominent. The left of the vale we found was bounded by the Jhur Range, a feature of minor magnitude, and of soft outline. The eastern line of hills, north of Takatu, takes the names of Mulla and Barai, and there is a peak called Surana. A little to the north of Zarghun Karez, we insensibly reached the water-parting between branches of the Kakar Lora and the Surkhab, but at this season there was no running water in the bed of the stream, though the village lands find sufficient for irrigation from karezes. Soon after passing Zarghun Karez, the Jhur Range sinks into the plain, and at its termination we find the village of Khanizai situated in the midst of a wide plain. The plain is surrounded on three sides by high ranges of hills, and, stretching for many miles to the north-east, terminates under a fine mountain, which we afterwards ascertained to be the Kand Peak. Under the peak, and to the south of it, there is a low and open pass, and this, we are informed, leads direct into Zhob.

Due east of Khanizai there is an opening in the range, and at some distance within the outlying ridges a commanding peak rises, which is described to us as Surghwand. This opening in the hills, we are told, leads direct to Borai, Tal, and Chotiali.

We observe that from the Kand Peak a spur springs, which running direct towards Pishin, there terminates in a peak which is named Shorgandai, the spur itself being called the Timurk Range. The Balozai-Khanizai Plain, which forms the basin of the Surkhab, extends to the south-west, following the course of this stream between the Jhur and Shorgandai hills, and it thus forms a continuation of a fair highway of plains in a great loop running along the whole Kakar border of the province of Pishin.

These features, hastily observed, we were able to understand imperfectly, but the expedition on which we were engaged could not be prolonged to enable us to pursue our investigations and complete our topography. We wished much at that time to look into Zhob and Borai, and actually visit the water-parting from the great spur of the Safaid-Koh, to the Indus on the one hand, and to the Sistan Desert on the other. We halted at Khanizai one night, and on the following day the column was directed over the Surai Mugzaie Pass towards Kila Khushdil Khan. Before we left, Colonel Browne, having lost sight of Chiltán, calculated a base between two hills by timing the report of guns, and thus gave a new support to our topography.

It was not at that time likely that either Colonel Browne or any of us would revisit these parts, and we left the work of discovery incomplete, with much regret.

An idea of the scenery and physical character of the country so far under description may be obtained from the accompanying Sketches, Figs. 4 and 5. Sketch No. 4 exhibits the length of plain along the Kakar border, looking back towards Kujlak—the reverse of that view which attracted our notice at the commencement of the expedition. The superiority of Mount Takatu is here very prominently shown, and it rightly asserts itself; for in every position it forms a striking and beautiful object in the Pishin landscape. In Sketch 5 we view the opening in the range towards Borai, and become acquainted with Surghwand, a peak which will in future enter into our geographical descriptions. The village of Khanizai stands in a well-watered portion of the great plain, which produces all the ordinary grains in fair abundance—more than sufficient, as we fortunately found, for the inhabitants and for our troops.

It is not, however, our purpose to enter into minute descriptions of inhabitants or of produce, but to consider specially the physical aspect and the framework of the country. To enable us, therefore, to complete the eastern border, we shall now leave the track of the reconnoitring expedition so far followed, and pass on to a time four months later, and note the discoveries made on the return march of the columns towards India.

For this operation, under sanction of Government, the arrangements with the tribes for the supply of the troops were made by Major, now Sir Robert, Sandiman, K.C.S.I., and our columns were halted for organisation at Balozai in the admirable position afforded by the great plain there. We ourselves reached that place on the evening of the 22nd March, after a somewhat forced march from the Helmund.

Simultaneously with the entry into Kakar country, it was considered advisable, as a military measure of precaution, to reconnoitre to the right as far as Ahmedun, and to the left as far as the Zhob border.

The expedition to Ahmedun was entrusted to the direction of Colonel Browne, and we accompanied the reconnaissance towards Zhob. This reconnaissance, which was made on the 23rd March, was supported by eighty rifles of the 1st Goorkhas and eighty sabres of the 15th Hussars, under command of Captain Langtree. The expedition was accompanied by Captain Heaviside, R.E., who superintended the running a traverse by a native surveyor. Cpatain Wylie attended as political officer, and a native of Balozai acted as guide.

We found the plain through which the western branch of the Surkhab flowed extending to the north-east, perfectly open, for seven miles, with a gradual ascent; the vale then narrowed, being enclosed between low hills. For two miles the track led up the bed of the stream, which found its way through a defile of low cliffs and rounded hills of soft strata. At about the ninth mile we emerged upon a wide plateau, saucer-shaped as regards its cross-section, and extending longitudinally with a gradual rise as far as the eye could reach. We here find ourselves abreast of the village of Tlarai, which, nestled in fruit-trees, lies on the slopes of a limb of the Kand Mountain, which rises to the left of the pass. We are some distance yet from the water-parting which we wish to reach. As it was late at starting, and the distance considerable, we left the infantry on the plateau at the tenth mile, while we pushed on with the cavalry for further exploration. During this time the native surveyor was running his traverse with the plane table.

We rode for six miles over the very open, gradually rising plain (Fig. 6), and reached the village of Mehtarzai. The inhabitants of the village, never before visited by any Europeans, turned out peaceably to communicate with us, and we had a long conversation. We were informed that they and all the people of the plateau were independent, not having ever been under the rule of the Amirs of Kabul, and that they hold only a slight allegiance to Shah Jehan, the Zhob chief, though they belong to the family of the Kakars.

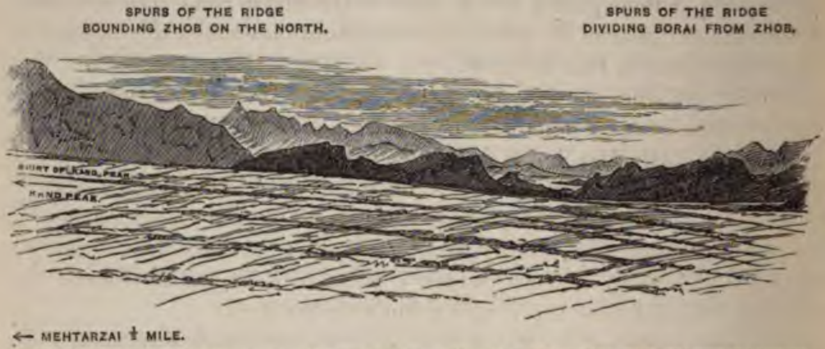
SPURS OF THE RIDGE BOUNDING ZHOB ON THE NORTH.
SPURS OF THE RIDGE DIVIDING BORAI FROM ZHOB.
SKIRT OF KAND PEAK
KAND PEAK
← MEHTARZAI ½ MILE.

FIG. 6.—VIEW LOOKING E. BY N. DOWN THE ZHOB VALLEY FROM THE WATER-PARTING OF PISHIN AND ZHOB.

From our point of view on the skirt of the Kand Peak itself (Fig. 6) we saw the spurs which, springing from the great parent spur, terminate on the Zhob Valley and form a long perspective, bounding it on the north. We observed on the right the commencement of the spurs which project from the ridge, which we afterwards made out divided Borai from Zhob. The fairway down the valley and the first plains were visible, the direction of the valley lying 15° north of east.

The water-parting was somewhere abreast of the village in the centre of the saucer-shaped plateau, which, by a uniform and easy slope, such as that by which we had gained the summit, descended towards Zhob. Our calculations gave the elevation of Balozai to be 6392 feet above the sea, and that of the Mehtarzai Kotal to be 7139, the rise was therefore about 750 feet in a distance of 15 miles. The natives call the water-parting Sarah Buzzah, and the whole plateau is named Kahan; in width it is about five to six miles, and the length may be 12 miles.

The whole area, which is of a light soil, is more or less under cultivation. The few villages we saw were surrounded by orchards, but there is a lack of trees elsewhere, though there is a sparse growth of grasses and shrubs.

Kand Peak was ascertained by our survey officers to be in latitude 30° 48′, and longitude 67°. 29′, therefore, 55 miles south-west of its position on the old maps; the spur of the Safaid-Koh (by whatever name we may eventually call it) consequently has a more westerly direction than has hitherto been represented, and forms the eastern boundary of Pishin. Kand Peak we had seen snow-clad, and forming a commanding point as we marched along the Daman road, coming from Candahar. As we opened the Barshor Valley it came well into view, and asserted itself as one of the chief objects in the ranges which form the boundaries of the Pishin plains.

The physical character of this pass, its comparatively low elevation, the easy gradients leading to it, and the cultivated, open nature of the habitable plateau, mark it as a way of communication between two great systems of populous plains, which must in the future come into use, and we are sure to hear of it again. This exploration defined the extent of the Pishin basin in this direction.

These reconnaissances completed, and all being in order, the second column, under command of Colonel R. Sale Hill, 1st Goorkhas, was on the 24th March put in movement, and the General and staff marched with this body. The first column, under command of Major F. S. Keene, 1st Punjab Native Infantry, and under the guidance of Major Sandiman, was already several days in advance in the Borai Valley. The third column, under command of Brigadier-General J. Nuthall, was to follow the second column on the 25th.

The route selected by Major Sandiman was up the eastern branch of the Surkhab through the opening, represented in Diagram 5, which leads direct on the Surghwand Peak. The track lay across the plain, gradually rising up the mountain skirt, and entering the low hills by an open passage. To cut off a detour, made by the river to the north of the direct line, we pass over the Mosai Kotal at an elevation of 7078, and then gain the bed of the Togai stream, which we find to be 6954 feet above sea-level. The Surkhab here assumes the name of Togai. There appears to be no physical difficulty in following the valley. The road now winds up the valley, crossing and recrossing the stream. We pass hamlets of the Yusuf-Kach (Isaf Kach) settlement, cultivated plateaux, and note fruit and willow groves, with houses roofed with timber and grass. We encamp in an amphitheatre on a sloping field, which is pretty well covered with grass; and altogether there is a more abundant vegetation, gratifying to our eyes.

An ascent of some 400 or 500 feet to the height on the south of our camp reveals to us the configuration of the country. The point ascended is called Zuddin. The country spread out at our feet is desolate and weird. A rough plain extends easterly and south-westerly, fitted into the base of the line of hills which forms the southern boundary of the Togai Valley. To the south-west we recognise many points. Ahmedun is not visible, but we make out where it lies, and the lumpy plain we look over extends to the hummocky country about Ushmughzai. Takatu, a fine, conical object, marks where lie Quetta and Kujlak. The eastern affluent of this branch of the Togai finds its source in an upland called Pinakai, which is at the north base of Mazwah.

To the south-east we see fully developed a mountain mass, which, with Surghwand, we had observed from afar as we were marching eastwards. It is now revealed to us to the base, extending as a precipitous ridge twenty to twenty-five miles long. Mazwah is the name given to it by Kullu, a very intelligent guide who joined Colonel Browne here. An affluent of the Togai rises in the plain before us, coming from the south-west and from the east in two or three branches, and the combined stream finds its way through a gap in the hills a little to the eastward of our camp. To the north the hills rise to considerable heights, the crest of these being retired from the Togai Valley. The northern slopes of this range descend towards the Mehtarzai Kotal, and the drainage of the south reaches the Togai stream.

The elevation of the Yusuf-Kach camp we found to be 7180 feet, and the distance from Balozai being nine and a quarter miles, we have a rise so far of 788 feet, and the gradient following the river would be less severe.

The course of the march on the following day was up the Togai Valley, which, hemmed in by a line of hills on either hand, had a direction at first east and then E.S.E. We passed several pretty hamlets, plots of cultivation, and groves of willows. We noticed one rather considerable stream, which joined the Togai from the ridge to the north. The valley rises gradually, there are no difficulties to be encountered in the construction of a road for wheeled traffic, and Colonel Browne considered that the turns were not too sharp for a railway.

So far we have had Surghwand as a fine mass in our front, but now on turning its shoulder we see it in flank, and it loses in beauty of form. Gradually we enter on a highland country of confused low hills, composed of highly-coloured earths and clay. The growth of grasses and underwood increases, and cypresses of great age and of grotesque forms are grouped and dotted over the landscape. Mazwah rises on our right front, and becomes a most imposing and picturesque object.

At the 11th mile from Yusuf-Kach, the head of the Togai is gained, and the height is found to be 8277 feet, making a rise in the 11 miles of 1097 feet. Here is the water-parting of Pishin and Sibi waters. The pass is called Ushtirrah Sirra; it is situated to the south-west of the peak of Surghwand, and is about four miles distant from it. The country around for many miles is quite uninhabited, and there appears to be an absence of water in the neighbourhood of the kotal.

We were unable to make the ascent of Surghwand, or ascertain its physical character; and this was the more to be regretted as it proves to be in some respects the most interesting of the summits of the great range which we were studying. From its crest we should have seen into Zhob, into Borai, and also into Pishin. From its slopes waters flow in four directions—towards Dera Ismail Khan, towards the Kuchi Plain, viâ Borai and viâ Sibi, and back to the Sistan Desert, viâ Pishin.

We have now, in following the Kakar Lora and the Surkhab to their several sources, ascertained and defined the limits of the Lora, or Pishin, basin, on this eastern side of the province, and become acquainted with three passes and roads leading towards India. We have found most prominent as landmarks, and also as grand mountain forms, the Peaks of Kand and Surghwand, and the precipitous ridge of Mazwah, and the isolated promontory of Takatu. Toba Peak and Mount Chappar, prominently given in the old maps, we have not heard of. The line of water-parting is thus through Kand, across the Mehtarzai Kotal, up Surghwand, down to Ushtirrah Sirra, across the Pinakai upland, then skirting Mazwah, through the lumpy plain to Ushmughzai, and on to the Surra Khwulla and Hunna passes, where it reaches Murdar, a well-known point.

Northern and Western Boundaries.—Having thus disposed of the eastern side, so far as we are able, we will turn to the northern and western limits of the basin.

We know now that the Timurk-Shorgundai promontory is rooted into the Kand Peak. The western faces of this ridge drain into the Barshor Lora—the ridge itself forms the eastern boundary of a great bay of the plain which runs north-east of Khushdil Khan, up the valley of the Barshor Lora. We have penetrated some little distance within the low hills in the direction of Barshor, and gained a high point on the western side of the valley. We found the Lora making its passage through the hills; a bright clear stream, with a considerable amount of water, and a bed which told us that the drainage area must be very extensive. We were unable to see the open valley which was said to lie within the hills. Up to the time when we left Pishin no one had explored the upper portion of the Barshor River; but it is probable that this interesting part of the province has since been examined. Up this valley a road to Ghazni leads, and it was used by our troops in the old wars.

Continuing our course westerly, we find that the range forming the western boundary of the Barshor Plain terminates in a promontory at the villages of Brahamzai and Zeri. Still more to the westward, opposite the large village of Alizai, an opening of the range occurs, but of a different character from the valleys of the Loras and Surkhab. Here the skirt of the mountains rises rapidly, and leads to the Karatu Pass by a steep gradient. These parts were explored by Colonel H. Moore. Taking a departure from the village of Zumri, Colonel Moore, at about 15 miles distance from that place, came upon the edge of the Toba Plateau. A road to Ghazni could be traced over a plain which stretched for miles, bounded by low hills to the north, and a track led to the Kadanai plains, and on to Candahar. These extensive plateaux fill up the whole mass of the angle from here to the Khoja Amran. They are the summer camping grounds of the Kakars and Achakzais, and we thought the elevation of 7500 feet would afford a suitable sanitarium for our troops.

We are much in the dark as to that part of this whole mountain range where it springs from the parent spur. We surmise, however, that it will be found to be rooted into it some 50 miles to the north of the Kand Peak.

Coasting along the skirt of the range we find it broken only by lesser watercourses, up which lead tracks to the Toba Plateau. The glacis formation is here seen in a very remarkable manner—tilted plains extend from the mountains till they merge in the level plain of the Pishin Valley itself, the whole way from Alizai to Arambi-Karez. Along this formation, unimpeded by deep nullas or river courses the Daman road to the Khojak runs. At Arambi-Karez the mountains project into the plains as a promontory, and then occurs the recess and amphitheatre of Kila Abdullah Khan, which is situated at the south side of the recess.

Into this basin short valleys, springing from the Toba Plateau and the crest of the Khoja Amran, converge, and the easy slopes and valleys give a pleasant locality for the Achakzais, who have always here lived a wild, semi-independent life, owning scarcely any submission to the amirs. In the cold weather many of the tribe migrate to the desert and in the hot weather the Toba Plateau affords a cool retreat.

During our march on Candahar the Achakzais committed a massacre of a few detached men, and attacked one of our convoy escort camps. A column was marched to punish the offenders, but they absconded to the mountains. During this expedition Arambi, the chief village of the clan, was visited, for the first time, by our troops. The locality is described as a flourishing valley with a good deal of cultivation and fruit-trees.

So much has already been written on the subject of the Khojak and the Khoja Amran generally, that a minute description will not be necessary. We may not, however, leave unnoticed passes which are now routes easily traversed for even wheeled traffic. The Khojak Nulla is a dry river bed; wide and ascending easily, it offered a track for a road which required no making. At about the ninth mile from Kila Abdullah Khan the spurs press on the nulla and it becomes a defile. The defile at about a mile from the top is still wide enough to afford camping ground, and there is a good deal of khinjak wood in the valley and of brushwood on the slopes of the hills. Gradually the nulla is completely compressed between rocky sides and the gradient increases, and for half a mile from the top it is very steep.

In three days our troops improved, sufficiently for camel and mule traffic, the native tracks, and in one part we brought into use a portion of the road made during the old expeditions. The summit is more or less rounded, and we were enabled to cut out of the hill-side platforms for siding guns and carriages. The descent is far more abrupt than the ascent, and at first the passage of laden camels caused these poor creatures much suffering, and the loads were cast, and blocks of the transit took place. In a short space of time it was impossible to make roads with good gradients, so to pass over guns a slide was made, having an average slope of 30°, which led from the top down to the commencement of an easy slope which extended down to Chaman. In a day and a half a whole battery was passed over, and a steady stream of troops, camels, cavalry, guns, moving onward, and of unladen camels returning, produced a busy scene of traffic from early morning till dark.

The operations of road-making were executed by the troops and a few Ghilzai labourers, under the skilled direction of Colonel W. Hichens, R.E., and his engineer officers. The passage of the Khojak occasioned much arduous work, which was executed by all concerned with an admirable spirit.

We were not willing, however, to allow the opportunity to slip of perfecting the communication. A line of road was at once traced out suited for wheeled traffic. The direction of this work was left to Lieutenant H. S. Wells, who executed it in six weeks with a gang of Ghilzai labourers. The length of the road is one mile 880 yards, its width 13 feet, and the average gradient about 1 in 14. The soil is so well suited for its maintenance, and there is so little drainage area above the road, that it is almost indestructible. We make the height of our camp on the east side of the Khojak 6742 feet, and that of the kotal 7380.

From the Khojak Peak, 8017 feet, and from the ridge generally, there is one of the most surprising views we have ever seen. The plains of Kadanai, leading on to other plains, are laid out like a map, and, seen in the marvellous clearness of the frosty air of December, the effect was most extraordinary. Beyond the plain, ranges of strangely isolated masses of hills run in parallel lines north-east and south-west, and jut out towards the desert which lay to the south like a sandy shore. There were rocky hills far away in the midst of the desert, appearing like veritable islands, and islets occurred in the Kadanai Plain. There was no wood and no verdure on the plains, and at that elevation and distance it was not possible with the naked eye to make out any villages, and we could hardly do so even with the glass. The aspect of this sterile-looking country did not foreshadow to us the sufficiency of food afterwards supplied at some of our camps on the way to Candahar.

The Khoja Amran, a uniform and featureless range, forms a regular rampart between Pishin and the country beyond, which is some 2000 feet lower than the Plain of Pishin. The pass next in order through this barrier is the Roghani, a track only fitted for foot and horse traffic. Opposite Gulistan Karez there occurs the nulla up which lies the great kafila road to Candahar. The pass debouches on to the plain on the west side at Gwaja, which gives its name to this route.

Our officers having pronounced that the Gwaja was by nature a much easier gradient than the Khojak, and therefore suited for the passage of the heavy artillery, Lieut.-General, now Sir Donald, Stewart decided on preparing it for that arm, and for the march of the division led by himself in person. Colonel R. H. Sankey, R.E., was therefore directed to superintend the works, which were executed by our officers and troops. The native track was widened and improved, and by the devotion and energy of the troops the pass was ready for use in a very short space of time. The Spinatija Kotal is much lower than the Khojak, it is approached by a long, gradual ascent up a nulla. The descent on the west side is steeper than the ascent.

The elevations and distances show the nature of the gradients:—

Gulistan Karez	5112 feet
Ispintaza or Spinatija Kotal 12·2 miles	6888 ,,

giving a rise of 148 feet per mile.

The distance from the Kotal of Ispintaza to Gwaja, where the more level skirt is reached, is 10 miles, and the elevation of that place is 4591 feet, which gives a fall of 228 per mile, or of 1 in 23; it is probable, however, an easier descent may be found. After the Gwaja, the Khoja Amran offers no break to the south-west until it comes to an end.

As we were traversing the great plains of Pishin, from Haikalzai to Abdullah Khan, and from the Gazarband to Gulistan Karez, having the profile of the range in full view, we used often to wonder how the great plains extended to the south, and how the Khoja Amran finished. We often longed to explore this region, but having secured two good practicable routes over the range which answered our purpose, it did not fall within the limits of our programme to extend our explorations so far to the left. Subsequently, under the orders of Lieut.-General Stewart, expeditions were organised to report on the country in the direction indicated, and we are indebted to Major W. M. Campbell, R.E., to Captain P. J. Maitland, 3rd Sind Horse, to Captain Wylie, and to Dr. O. T. Duke, for information of much importance on this most interesting quarter of the basin of the Loras.

There is in every mountain system a characteristic configuration which only becomes apparent as we complete our study of it, and plot the work of survey. It is of the greatest benefit if we can speedily grasp the character, as it is often the key to the whole nature of the

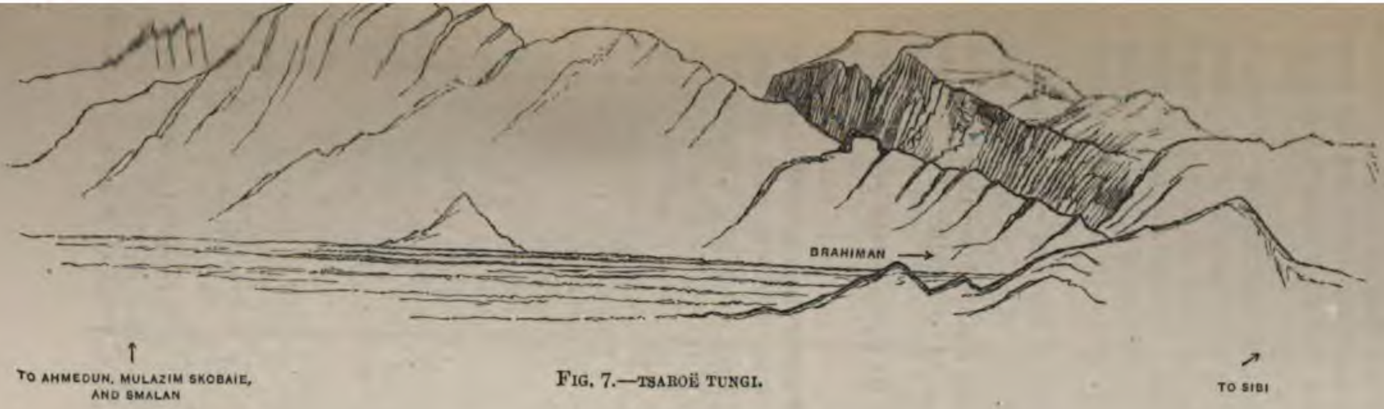
BRAHIMAN
TO AHMEDUN, MULAZIM SKOBAIE, AND SMALAN
TO SIBI

FIG. 7.—TSAROË TUNGI.

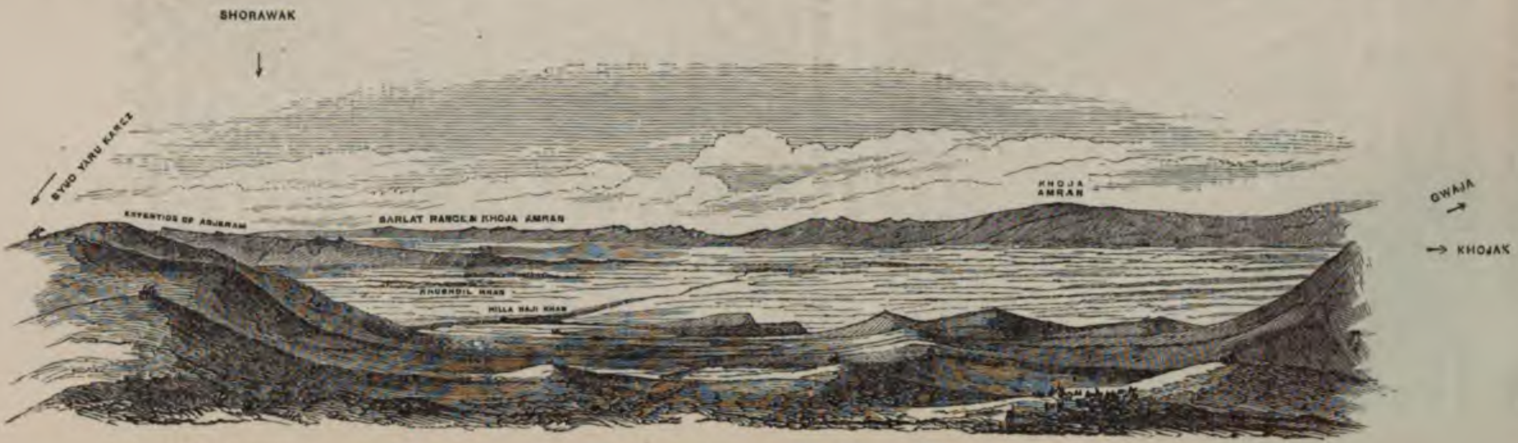

FIG. 8.—THE PLAINS OF PISHIN LOOKING TOWARDS S.W. SHORAWAK IN THE FAR DISTANCE. SARLAT RANGE 50 MILES OFF.

country. The marked feature in the physical character of South Afghanistan, is the uniform direction and parallelism of the ridges. The great ranges in which lie the water-partings often have a direction of their own, at an angle to the parallel ridges. We find the usual direction of the ridges is from north-east to south-west, and this is the general lie of the slope or tilt of the country.

The range we call the Khoja Amran has this character of parallel ridges, and the feature is exhibited in the outlying range which extends from Kila Abdullah Khan to Gulistan Karez, which leaves an open, nearly level plain between it and the main range. We shall see that the Khoja Amran, though it terminates, yet has the feature of a continued range, taken up by a parallel ridge running in a like direction to the south-west for a distance as yet unknown.

Immediately south-west of the Spinatija Kotal the Khoja Amran is continued under the names, first of Ashusta or Shista, and then Tang. Long spurs branch off to the southwards, terminating on the desert and on the cultivated plain of Shorawak. There are isolated hills carrying on the feature into the desert itself, and the desert sand is dovetailed into the hills. There is here exhibited an actual movement of the sand of the desert over the true land, which it swallows up under the action of the prevailing west wind.

Poti, 31 miles to the south-westward of Ispintaza, is at the end of the Khoja Amran, and on the edge of the Shorawak cultivated land, which is estimated to have a breadth of six miles, and a length of 13 miles down to Hisabat. Including the skirts on both sides, the breadth of the Shorawak Plain is 10 miles, and its length may be 50 miles. The Lora River enters the Shorawak Plain at Mir Allum Khan at its north-east corner, and flows down its eastern border. The river, however, has its waters drawn off by numerous irrigation channels, till in the dry season no water remains. In flood-time the water is stored in reservoirs. The water of the Lora being highly charged with a fertilising mud, the result of this deposit is that Shorawak is very fruitful, bearing all the common grains, &c., abundantly. The plain is 3250 feet above the sea and the climate is perfect in winter, though very hot in summer. Camels thrive well, and the tamarisk and other plants afford abundant grazing. The chief possessors of the Shorawak Plain are the tribe of Barechi Pathans. The Brahuis are mixed with them on the south border, and the Achakzais hold the north border.

The boundaries of this country are: on the western side the desert, on the north the spurs of the Khoja Amran, and on the east the Sarlatti, or Sarlat Range. The south border is not so clearly defined.

The nomenclature of the mountains in these countries is exceedingly difficult to decide. No two tribes agree in pronunciation or in the names by which they describe the same feature. Observers at the same time find it very difficult to catch the correct pronunciation, and, receiving their information from a variety of sources, no two travellers are found to agree. There is therefore much difficulty surrounding this branch of the geographer's duty. As a rule, we are apt to give a general name to a range of mountains, because we notice that it is a great physical feature; but the untravelled and unlearned natives have their own name for the particular portion of it known to each. One can only suggest that the greatest care should be taken in catching the pronunciation, in being sure that we have the right name, and in having it entered in plan and report in a perfectly legible manner.

The Sarlat Range commences a little to the south of Gulistan Karez, as a ridge parallel to the Khoja Amran, and divided from it by the Tangi gorge and by the Lora defile, also called Tangi. This ridge thus overlaps the Khoja Amran. At the north end this range receives the name of Walli or Salwatu, to the south it is called Salat, Salotu, Sarlat, and Sarlatti, and Dr. Duke adds the name of Singhbar. We prefer to use the name Sarlat, by which Major Campbell familiarly calls this feature. The western faces of the Sarlat drain towards Shorawak to the Lora, which in flood-time pursues its course between the desert on the west and this range on the east. The Lora basin is therefore here compressed to a breadth not exceeding 20 miles—a strange contrast to the wide diameter it has across the main plains of Pishin about Haikalzai. The eastern slopes of the Sarlat drain towards a valley called Ispinkai, which is about 2400 feet higher than the Shorawak Plain.

The north end of the Shorawak Plain is a meeting-place of routes. The great kafila road from Kelat to Candahar crosses the Lora at Mir Allum's Fort, and, proceeding by Poti, it turns the Khoja Amran, and gains the Gwaja and Candahar route. The only difficulty met with north of Shorawak is the short defile through the Chawéli Range, which is an east and west semi-detached spur of the Tang; the defile is 2·1 miles in length, it is not steep, but would require some labour to make it practicable for wheels.

It would be well if we could find a passable route into the Shorawak Plain from the north-east or eastward, but this does not appear to be possible. The road to Pishin up the Tangi gorges is very difficult, it has to cross and recross the Lora, which, in flood-time, would render the passage impassable.

Over the Sarlat Hills, to the eastward, there are three passes—the Shutar, the Salwatu, and the Bed Kotals; of these, the last is described as the best. It enters the hills about opposite to Hisabat, which is 13 miles south of Poti. For eight miles there is a gradually increasing gradient up to 1 in 23 to the foot of a final ascent, which is even steeper, and narrow. From the crest the descent leads to the fairly open valley of Ispinkai to a place called Iltaz Karez, 3½ miles distant from the crest.

There are a few huts here, and a stream and a tank, but no supplies. This road is therefore one which would offer considerable difficulties to the railway. It is not our intention to devote too much space to the consideration of the roads, but the question does arise here as to whether this route does satisfactorily turn the Khoja Amran. The country to the eastward, in the direction of Quetta, is crossed by a number of ridges, and cannot therefore be compared with the plains of Pishin in regard to the facilities offered for a railway; we are therefore led to the conclusion, that we shall not find any route which affords such facilities as the Gwaja, where the difficulties, we believe, may be overcome.

Southern Boundary.—In carrying out our purpose of defining the next portion of the frame or lip of the Lora basin, we now find considerable difficulty, as we have no plan, and only a sketch report of Major Campbell's to study.

As before mentioned, the Ispinkai Valley is, proceeding eastwards, the next valley to Shorawak. There is a branch of the Ispinkai Valley, which, equally with it, seems to take its origin to the north, in an offshoot of the Sarlat Range. This valley is called Kotori, it drains into the Ispinkai Valley, which runs parallel to the Sarlat Hills, and the waters of this last run southward, and fall into the Kaisar, which flows towards Nushki. We are unable to trace this connection, but from the direction of the head of the Ispinkai and Kotori valleys, we know that from where these spring there must be a water-parting towards Pishin, which defines the edge of the Lora basin in this direction. Following Campbell's track, we find that the feature next in order to the eastward of Kotori is an extensive vale running several miles to the north and also to the south-west, divided from the Kotori by a low water-parting. It seems to be bounded by hills in both directions. The width of the plain is three miles, it is gently undulating, with a good deal of level ground, and the elevation is about 5400 feet. The western edge of this plain appears to be about 20 miles from the Shorawak Plain, and the spot where it was entered is due east of Iltaz Karez, probably south-east of Poti. A short distance south of the track by which Campbell crossed, there is a water-parting, and from here water drains north into the Lora through the Kurum Dasht, and south to the Kaisar torrent by the Tilera Dasht. So that here we have again the edge of the Lora basin. All these valleys, Ispinkai, Kotori, Kurum, and Tilera are without settled inhabitants—the country is a grazing ground for the pastoral tribes. To the eastward of Kurum and Tilera a continuous range, called variously Zarisar or Aliser, divides these plains from Shorud.

Shorud is a plain at an elevation of about 4800 feet. It is well watered by karezes which have their sources in the Zarisar Hills. There are five principal villages, Makhmad Kheli, Chichezai, Panjpai, Sir Kozai, and Mial Khanzai. Chichezai, seven miles E.N.E. of the east end of the pass through the Zarisar Hills, is 18½ miles from Iltaz Karez. This valley, which seems to have its position now determined for the first time, will, when it has been completely surveyed and plotted, add much to our geographical knowledge, and having a drainage from south to north it belongs to the basin of the Loras.

Shorud receives the waters of the river marked in Wilson's map "Khurd Singbur." The Sir-in-ab, which is the combined river of Kelat, Mangurchur, and Mustang, also flows through a portion of the valley, and the combined drainage of this extensive basin then flows, under the name of Lora, northwards to Pishin, to join the Greater Lora there. This Lora is a salt stream, and it gives the name of Shor to the country it traverses—Shor-rud—we may therefore very properly name this Lora the Shorud Lora.

The boundaries of Shorud given by Campbell are: on the west the Zarisar Hills having a direction N.N.E. and on the east the Dinar Range a defined feature trending north by east. This direction will set the course of the Shorud Lora very far to the north-eastward of that indicated in Wilson's map, which shows it sketched with a north-west course from Panjpai until it falls into the Pishin Lora. The direction given to the ranges bounding Shorud renders such a course impossible. We believe that the confluence will be found to lie about due west of the Gazarband, and not far south of Segai, which is on the Lora, between the Gazarband and Gulistan Karez.

In the present state of our geographical knowledge of all this quarter it is impossible to make a satisfactory study of the water-partings of the Shorud Lora basin. The western lip is as yet very undefined. The area drained by this river is very extensive, and it would be very interesting to have a separate report on it. The Kelat branch appears by Wilson's map to rise in the Herbui Mountains, an offshoot of the great Hala Range. Thus from south to north, from the source of the Kelat stream to that of the Surkhab, the basin of the Loras is 160 miles across. In the highlands of the Hala Range are the sources of streams running in every direction.

While we are studying this portion of the Lora basin, it will be well to record what is known of the road which strikes south from Kelat to gain the sea at Sonmiani.

The distance from Kelat to Sonmiani is 340 miles, which is divided into twenty marches. Some of these marches vary from 18 to 24 miles, the stages being of this great length on account of the scarcity of water. There are only six places—viz. Sohrab, Bagwaná, Khozdar, Wudd, Bela, and Uthal—where supplies in any quantity are procurable, and at most camps little or nothing is to be had. The heat on the southern half of the road is naturally very great, rendering this route impassable during four months of the year.

The harbour at Sonmiani is unfit for vessels drawing over 17 feet of water; and this difficulty, added to the general impracticability of tl road, throws this route out of consideration in discussing the possibl roads to Pishin.

South-eastern Boundary.—We must now turn to the remaining portio of the basin under study with which we have a personal acquaintance.

The Great Chiltán, 12,000 feet, rises from a girdle of plains, whicl though elevated, and forming part of a high table-land, still leave muc grandeur to the abrupt forms of this commanding ridge, which was s far our leading landmark. The skirts of Chiltán give rise to water flowing to the Dasht-i-Bedaulat, towards the Shorud Lora, viâ the fertil little valley of Kanak, and towards Mustang. From a little to the wes of Chiltán flows the left branch of the Shalkot Lora. The right or Shul branch rises in the eastern skirt of Chiltán at Sir-i-ab. Other sources o this Lora lie in the Hunna and the Surra Khwulla passes. Chiltán Murdar, Takatu and the range called in succession Dinar, Musallugh and Anjeram, form the boundaries of the Shalkot valleys.

Having thus defined the lip of the whole basin as nearly as we ar able, we proceed now to give our impressions of the interior space—th plains and intersecting ridges.

Plains and Intersecting Ridges.—The Shalkot valleys and plains ar continuous, without the break of any dividing ridge. From Sir-i-ab t the base of the precipices of Takatu, there is one unbroken vale c plains and skirts, five to six miles wide and 15 miles long. From th Hunna Pass to the slopes of the Musallugh, for a distance of 16 mile there is one sweep of open valley. The valley to the west of th Chiltán ridge is no less open, and it meets the Quetta Valley, and con tinues and joins the Kujlak and Urumzai plains. Wilson's map give this feature fairly well; but the map of the Suliman Mountains, in th Society's 'Proceedings,' brings the slopes of Chiltán and Takatu unt they meet on the banks of the Lora. We would here venture to observ that the small scale on which such maps are drawn, does not permit th draughtsman to give any shading to such small features as the gentl slopes of the mountain glacis, or to the minor ridges and spurs. I such minor features can be represented, they should be traced with th lightest and most delicate indications.

The Shalkot plains, as we have just said, are continuous, and ru round the spur of Takatu, over which the Murgi Pass offers a short cu to Kujlak, the open vale of the Kakar Lora being produced right up t the Balozai Plateau, as described in the early pages of this paper. Thi distinct feature of plains of the Shalkot and Kakar Loras is divide from Pishin by ranges of minor character, and broken and confused hill

From Anjeram, in continuation of the range, a long spur is thrus out to the north-east, which, though broken and gradually sinkin into the plain, can be traced all the way to Khushdil Khan. Thi range is crossed by the Gazarband, in a direct line from Quetta t

Gulistan Karez. And here the range for some distance divides the Shalkot and Kakar Lora Plain from the great Plain of Pishin.

From abreast of Nilai, a little to the north of Kujlak, there commences the defined uniform feature of the Jhur Range. Though of minor elevation, it has a distinct character, dividing as it does the Kakar Lora Valley from that of the Surkhab, and the plain of Syud Yaru Karez. The southern termination of the Jhur, and the northern extremity of the Anjeram, throw off many wave-like lesser ridges and hummocky hills, which complete the separation of the Kujlak Plain from that of Syud Yaru Karez.

This configuration has a great importance, as it divides the basin into compartments. The boundary between Kelat and Afghanistan runs diagonally from a little north of Kujlak, leaving that place in Kelat, and Julobghir and Mehtarzai in Afghan dominion.

The Kakar and Shalkot Loras approach each other near Julobghir and Mehtarzai, and there is between them a level tract down nearly to their junction; the left bank of the Shalkot stream, however, has cut into the projections of Anjeram, and the Kakar Lora has on its right bank scarped those of the Jhur. The road to Pishin crosses the Shalkot Lora near Kujlak, where the banks, 20 to 25 feet high, are composed of clay. The road then crosses through low hills, finding some level ground and undulations mixed, and passes both streams a little to the eastward of the junction. After crossing the Kakar Lora, the edge of the open plain of Syud Yaru is reached at the village of Haidarzai.

The Syud Yaru Plain is wider than the plains just described, and extends to and joins up with the Surkhab Valley, and is unbroken in the direction of Khushdil Khan. To the westward, the long, broken projection of Anjeram divides it from Pishin proper. Having reached this dividing ridge, we find the whole plain spread out in one vast surface, extending to a distant horizon in the direction of Shorawak, where the Khoja Amran may be seen fading away into the horizon, and the Sarlat can be recognised floating like an island in the mirage.

We were first made completely acquainted with the whole arrangement of the internal part of the Pishin basin on gaining the top of the Surai Mugzai Pass, and in our excursion in the Barshor Valley.

This great open space is inhabited by a population of Syuds and Tarins, with a fringe of Kakars and Achakzais. Generally employed in agriculture and engaged in mercantile pursuits, they are decidedly peaceable in their habits, and would gladly be defended from the incursions of their more warlike neighbours who live in the hills which bound the north, east, and west sides of the province. Though the country is strangely bare of vegetation, it is abundantly well watered by the numerous streams and karezes which descend from the surrounding mountains. Chains of villages follow the watercourses, and the area of cultivation is even now very considerable. This interesting country requires repose and the fostering care of a strong and goo government.

Considering the miraculous change brought about by the last twent years of peace and quiet in the Punjab and in Sind, it is possible to realis what will take place here. Before the next twenty years will hav come to a close, the railway will have passed on towards Persia, throug tracts of country over which it is even now possible to drive a phaeto Roads or railways will have been constructed down the easy and fertil valleys of the Kakar country to India. The area of cultivation wi have increased, and groves will have sprung up around the villag and along the watercourses. The people, already traders, will hav benefited by the new communications, and in carrying their produ down to India and to the sea, and returning with European goods, the will have learnt by their intercourse the value of commerce and of peaceable, firm, and just rule. Such has been the change produced i many other countries, and notably in those mentioned, which hav passed under our influence in India, and we may safely draw such picture of the immediate future of Pishin.

It is the duty of the explorer to obtain the records of the physica character of the countries he visits, and to convey the impressions h forms to the world, and in doing this his hope is that civilisation an benefit to man may follow in his track.

2. From Pishin to the Suliman Mountains.

This paper would be incomplete if we were to omit to describe th discoveries made on the return march to India between Pishin and th Suliman Mountains. I propose, therefore, to describe shortly the leadin features we met with.

At Ushtirrah Sirra, which it will be remembered is the water-partin of the Surkhab flowing to Pishin, we find the head of a drainage whic eventually reaches the Nara or Sibi stream.

At five miles westward from the pass the valley we descend is met b a branch valley coming from the east, both valleys opening to eac other, hemmed in on the south by the massive ridges of Mazwah an Spinskhar. The combined stream of the two valleys escapes in a southerl direction by a gap, a very abrupt feature, which is called Lehrgut Five miles from the junction the Pass of Momandgai is reached elevation 8457 feet. Here we find the water-parting of a new drainag into the Borai Valley, which runs without a break by a uniform slop for 82 miles in a direction very nearly due east.

We must not, however, leave these highlands without remarking o the highly picturesque character of the country, particularly betwee the two passes. Mazwah and Spinskhar rise abruptly into gran rugged forms, having their lower slopes gracefully disposed and varie

CAMP CHIMJAN, LOOKING EAST

old times a post said to have b
ultivation, and ruined walls sti

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with a growth of cypress and other trees and shrubs (Fig. 10). In our travels we have not seen anywhere so luxuriant a growth. Momandgai is the division between Khorassan and India and also between the Panizai and Dumar sections of the Kakar tribe. The valley stretching to the eastward, descending gradually, soon loses its wooded character, and the slopes and plains assume the bare aspect of the South Afghan landscape. At Obushtkai, 8½ miles from the pass, the two bounding ridges are far apart; and at Chimjan, 5½ miles further, the valley commences to be spread into wide plains.

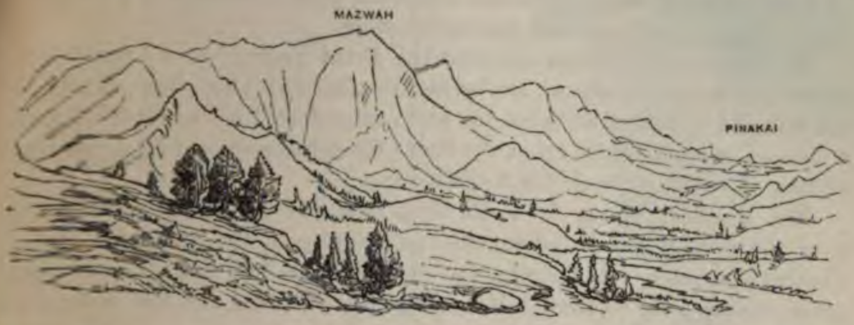


FIG. 10.—VIEW WESTWARD, ON MARCH TO DERAJAT, WATERSHED OF THE PINAKAI IN THE DISTANCE.

Three miles to the east of Chimjan there stands the singularly-formed table mountain called Siazgai (Syajgai), which, rising well out in the plain, is a natural fortress (Fig. 9). There is here a meeting of plains and routes, and the locality has in the eyes of the people a great prestige and importance. In the old time the Moguls used the hill as a military post, and it seemed to us that it might again serve such a purpose. There is cultivation at Chimjan, and the fruit-trees and fields present a refreshing contrast to the wild hills and plain. Siazgai stands out in noble proportions as a principal object in this strange and yet grand landscape.

The offshoot from the so-called Western Suliman lying to the north of the Borai Valley divides it from Zhob. Another parallel limb separates Borai from Smalan, Tal, and Chotiali. Thus we find three great valleys having their origin in the highlands east of Pishin so disposed as to offer a choice of routes towards the Punjab. We never could have anticipated that this hitherto unexplored country would prove to be laid out so favourably for the routes we were in search of.

The lower portion of Borai is well watered, the villages are close together and well built, and to afford security against the attacks of the Marris, who sweep their marauding bodies up to this distant valley, every village is a little fort. Orchards peep above the enclosures, and fields extend from village to village. This fertile portion of the valley stretches from Ningand to Sharan, and on to Chinai. The boundin ridge between Borai and Zhob has a most strange physical characte It is a huge glacis or whale's back, having cross parallel ridges on it surface, which are disposed like cross waves on an ocean swell. The li of these ridges is about north-east and south-west. Between the ridge there are wide gaps and open passes into Zhob.

Now it must be understood that the Borai Valley has a length about 100 miles of almost unobstructed plain, varying from five ten miles in width. At Sharan the plain extends still in an easterly a a north-easterly direction; but the Borai River turns sharp to the sout finding an outlet through the Anumbar gap.

The stream draining Western Borai is called the Lorai, and th from the eastern valley Sahan, the two meeting in the Anumbar ga The hills on each side forming the portals of the gap are abrupt a grand masses; the western hill is called Khru (Kuru), and the easte Guddibar (Gadiwar). (Fig. 11.)

While we were in these localities we were informed of a route v Mekhtar and Karwadi which leads out to the Rakni Plain, avoiding th Barkhan Plain, following a direct line towards the Sakhi Sarwar Pas Here also other important features were made known to us. Thus w were told that the Zhob Valley had a breadth of plain greater than th of Borai, and it was clearly explained that its outlet is towards the Galer stream. We were also informed that due east from Sharan there lies a elevated plateau, to which the plains of Zhob and of Borai extend. I this dome-like mass, to which the natives give the name Sahara, are t be found the water-partings towards Zhob, Borai, Rakni, and the Vihov Pass. The Zhob Valley cannot, therefore, as represented in the recent edition of Walker's map of Turkistan, find an exit through the Suliman by the Vihova. When we were on the top of the Fort Munro Pass, on the Suliman, this feature of the Sahara Plain was pointed out to us looming in the distance, and we could see the Rakni Plain extending as far as the eye could reach in a direction towards it.

The physical character of the angle between Borai, Zhob, and the Suliman is most interesting, and ought to be cleared up at the first opportunity. The gap of the Anumbar is a most important feature. By it we were able to escape in the direction we wanted to go without attempting a more northerly and possibly more complicated line of country. We here open out on the Luni country, which is wide, level, and cultivated on the banks of the Anumbar. The valley trends to the south-west, and meets the Tal Chotiali Valley. The drainage area of this vast system of valleys is a very notable feature, as here are collected the floods which have occasionally swept over the Kachhi Plain.

We might have followed the Anumbar down to Chotiali, and thus have turned some of the rough country we now met with, but we

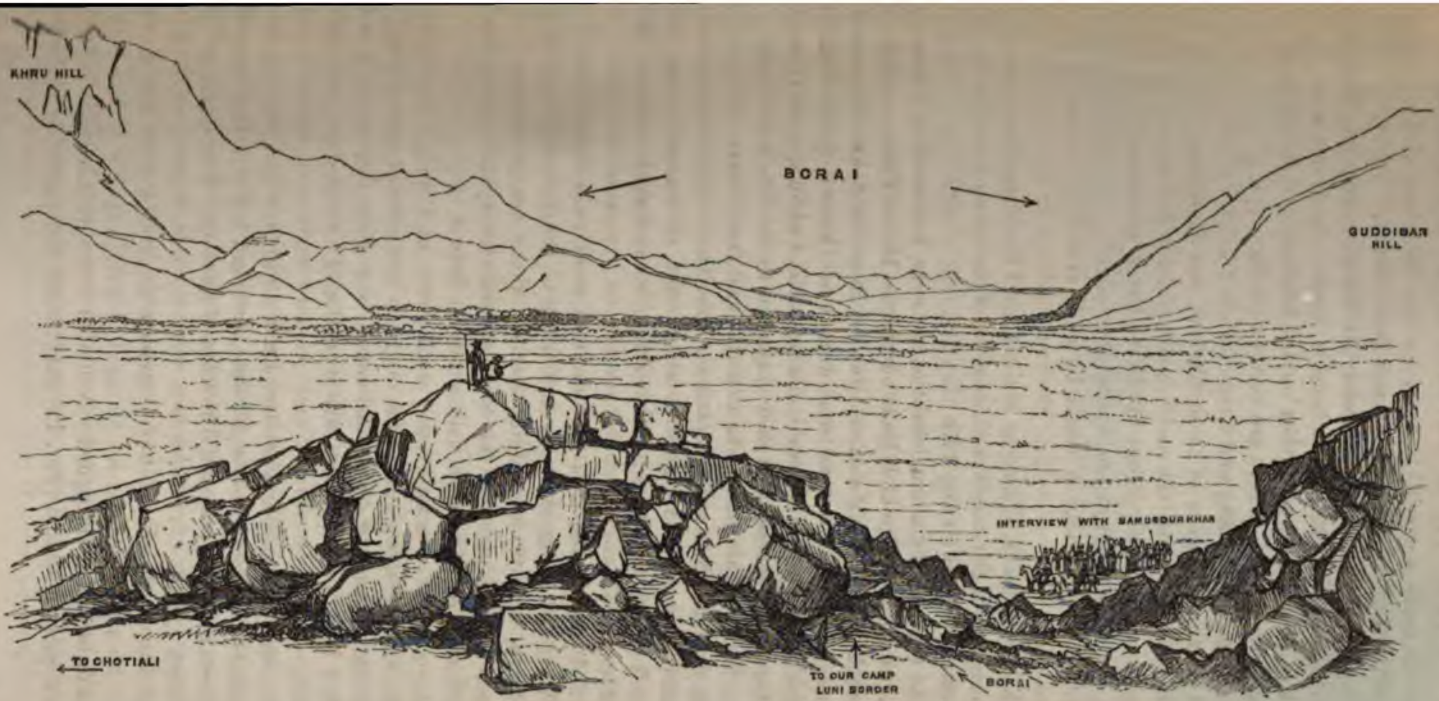


FIG. 11.—VIEW N.W. BY N. THROUGH THE ANUMBAR GAP. Zhob lies beyond the distant range of hills.

preferred to make a straight course for the Barkhan Plain viâ Tri Kuram, Chimalang (Tsamaulang), and Bala Dhaka.

The country intervening between the Luni country and Barkhan is uninhabited, and a veritable debatable land. In it no man's life is safe. It is overrun by all tribes on its borders, viz. by Khetrans, by Lunis, and by Marris. There are here two valleys lying north-east and south-west, the Chimalang and that of Bala Dhaka. These valleys are bounded by three ridges; of these, the last, the Jandhran, is a long and formidable feature, and the only practicable path over it to Lugari Barkhan is by the Han Pass. This Pass was easily made fit for our passage, but it required careful loading of camels. We thought that a cart road or even a railway could be made over it by pursuing a more circuitous track.

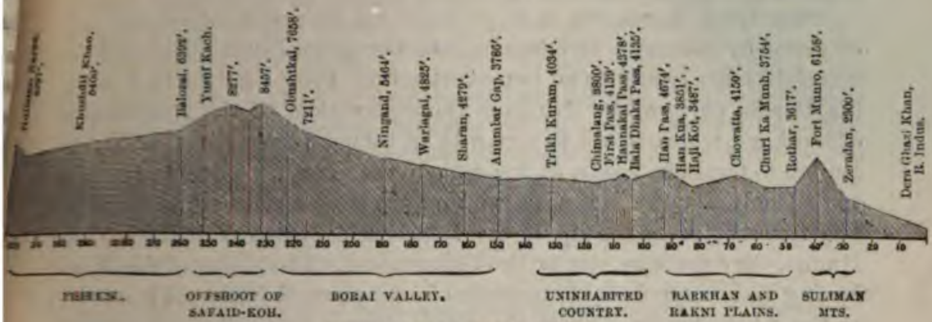
The Khetran Plains, joining on to the Lugari Barkhan Plains, run along the eastern foot of the Jandhran Range; and the outlet from the Han and the debatable land is through the Han Durrah, a narrow gap 200 yards wide. At the foot of the Han there is, however, a more formidable gateway in an uplifted ridge of only a few feet wide. At the mouth of the Han Durrah stands the deserted town of Hasni Kot, abandoned some five years ago on account of the inroads of Lunis and Marris. The Barkhan-Khetran plains are open, well watered, and fertile, and they lead one to the other, presenting easy passages to the Chachar Pass to the south-west and to the Rakni Plain to the north-east. Arrived here, we found we had reached a friendly country—the Pathan tribes were left far behind—we were now able to relax some of the severe duties of watch and guard which had hitherto been so necessary to the safety of our columns.

The Suliman Range seen from the westward rises boldly above the Rakni Plain, and is a marked physical feature. Rothar at the foot, in the Rakni Plain, is 3617 feet high, and the point where we crossed is 6158 feet. The climate of the Suliman was in April most pleasant. On the border of Pishin we had snow in March, but down through Borai the weather was deliciously temperate, and spring was coming on. The fruit-trees were in bloom, and the corn an indescribable green. From a temperature of 40° to 50° we in one afternoon dropped down from Fort Munro to Zeradan, where we found the thermometer at 90° to 100°.

The country of the Derajat between the Suliman and the Indus is a rude jumble of old river beds and ridges, arid and hot with little verdure, which prepared us to enjoy the luxuriant trees and cultivation of Dera Ghazi Khan.

The Chachar Pass was found to present a more gradual descent than the Fort Munro route, and we thought it quite capable of being made passable for wheeled transport.

The appended section (Fig. 12) will enable the reader to understand the gradients of the passes and the position and elevation of the plains between the Indus and the Kadanai Valley on the west side of Pishin.



Levels, in Feet; Distances, in Miles.

FIG. 12.—SECTION OF ROUTE FROM THE INDUS TO THE PLAINS OF PISHIN.

3. RAILWAY FROM SAKKAR TO CANDAHAR.

Since this paper has been in the press information has reached us of the completion of the railway from Sakkar across the plains of Kachhi to Dadar. This work is an accomplished fact, and we cannot but admire the energy with which the project has been carried into execution. All things considered, we believe that in the present situation it was absolutely necessary to choose this line, which at once connects the foot of the Bolan with our Indian system of railways. Whatever difficulties we may meet with in the future, consequent on the Indus floods on the one hand, and the outpour of water from the mountains on the other, must be overcome by suitable works and construction. As regards the Borai line, we think, after much weighing of the matter, that such a communication may be developed in the distant future; but in the meantime we possess what we immediately require, and at any cost the railway so far constructed must be extended to Pishin, and eventually to Candahar.

Dadar has an elevation of 750 feet, and the Bolan is a difficult route to the plains above. To avoid the Bolan, it is intended to divert the line up the Nara Valley by Sibi, and so gain the plains of Pishin at Gwal. We have no information of the exact direction of the line, but we know that the Ushmughzai Pass is the highest point on the water-parting between Sibi and Gwal, and its elevation is 6327 feet. The distance between Dadar and the passes into the basin of the Loras it may be possible by following the sinuosities of the country to spin out to 120 miles, but in this instance it will be necessary to surmount the 5500 feet difference of level.

There are three passes over which it may be possible to conduct the railroad, but in the present state of our geographical knowledge we cannot as yet know what may be decided on. The Hunna and Sura Khwulla lead into the Shalkot or Quetta plain. The Ushmughzai Pass leads direct on Gwal by the Sagarband defile. We have some idea that the choice will fall upon the latter.

Once Gwal is reached, it is probable the line will follow the loop of plains by Khanizai, and descend into the great Pishin Plain at Killa Khushdil Khan, which is an important point. From here the road along the Daman offers a line free from the obstructions of the many nullas of the Lora, which would be met with in taking a more direct line from Kujlak to Gulistan Karez, at the foot of the Gwaja. Thus, to sum up the difficulties to be met with, we find the most serious are that of the rise from Sibi over the lip of the Lora basin—whether it be by the Hunna, the Sura Khwulla, or the Ushmughzai. The plains of the Loras having been entered on, no obstacle of note presents itself till it arrives at the Khoja Amran. From the Khoja Amran to Candahar there are continuous plains, the principal obstructions being the numerous cross streams, which would require bridging, and wide water-ways.

In introducing Sir Michael Biddulph to the Meeting, prior to the reading of his paper :—

The PRESIDENT said there was perhaps no part of the world which, during the last two years, had attracted more attention from Englishmen than Afghanistan and the neighbouring countries. He felt it a great pleasure to have to introduce to the members Major-General Sir Michael Biddulph, an officer whom he had known well, and for whose character and professional merits he had a very high esteem. The Geographical Society had one privilege which was not possessed by many other meetings of Englishmen, and that was that they could talk about Afghanistan and its position without entering into any matters of political controversy. Whatever differences might exist with respect to other points, he was sure there would be none in any assembly of Englishmen about the recognition of the enterprise and gallantry of the officers and men both of the British and native forces who had been engaged in that country. Although Sir Michael Biddulph had not had what soldiers consider the advantage of any very severe actions, yet he and the forces with which he was connected had made longer marches, and probably had to suffer greater hardships than any other troops engaged in the expedition. But the present was not the proper time or place in which to go into questions about the operations of the army. What the Meeting had to deal with was the scientific result to geography, from the progress of the troops through countries which heretofore had not been accessible to Englishmen. Sir Michael Biddulph with his force went further than any other part of Sir Donald Stewart's troops, namely, to the River Helmund. He had the advantage of being an excellent draughtsman, and was probably better qualified than any other officer in his position to give a geographical account of the country which he traversed. The Meeting would, therefore, at the conclusion of the paper, be able to judge for themselves the value of the opinion which he (the President) had given as to Sir Michael Biddulph's merits.

After the paper, the President called upon Sir Henry Rawlinson to speak, as the highest authority present, upon the geography of Afghanistan.

Sir HENRY RAWLINSON said he was afraid he should not be able to furnish the Meeting with any new or interesting information on the country which Sir Michael Biddulph had described, since in his own passage through that part of Afghanistan he was unable to deviate more than a very little from the beaten track. However, he was glad of this opportunity of offering his testimony, such as it was worth, to the great value of the information which General Biddulph had placed before them that evening. He remembered, not very many years ago, at one of the Society's meetings, Colonel Macgregor, who was now chief of the staff at Kabul, brought strongly before the members the fact that at that time Englishmen knew more of the interior of China, or even of Africa, than of the countries on the Indian frontier. That was a reproach which could not now be attached to them. All geographers must have been delighted to see that during the recent operations in Afghanistan the sextant and the theodolite had been borne alongside the Gatling and the Martini-Henry. The results thereby obtained were not merely for the present day, but for the benefit of future generations, for geographical knowledge once acquired was acquired for all time. It was not a mere dilettante acquisition: it was utilitarian in the broadest sense, leading to commerce, and an improvement of the means of communication, and was a necessary preliminary to the civilisation of any country. It was upon those grounds that he ventured to impress upon the meeting the extreme value of the service which General Biddulph had performed. As had been stated in the paper, the country which had just been described had previously been unexplored by any European. Across it on the maps was formerly written "Unexplored." It was true that from native authorities a certain amount of information about it had been obtained. Major Raverty, who was one of our first, if not our only advanced Afghan scholar, had recently translated some very valuable memoirs in reference to this particular country, and presented them to the Indian Office. They would be of great interest to General Biddulph when compared with the result of his own explorations. The country between Pishin and the Valley of the Indus was traversed on one occasion by Baber Padshah, when he returned to Ghazni from Dera Ghazi Khan; and on another occasion by Dárá Shekoh, the elder brother of Aurangzebe, when he led an army from the Valley of the Indus almost in the very line which General Biddulph followed, direct to Candahar, along the Borai Valley. If it was not the actual route it was parallel to that taken by General Biddulph's column. But there was no European in Prince Dárá's force, and there was no attempt at surveying. All that was obtained was a barren list of names with a general description of the country, which really was of no use to practical geographers. He now proposed to notice one or two points that might be of interest to geographers in general. The district above the hills which General Biddulph had described, was in times comparatively ancient, namely, during the early Mohammedan period, a district of very great wealth and consideration. It stretched from Shorawak, including Pishin and Sibi, and took in all the western skirts of the hills. It was called *Bálish* or *Válish*, from a tribe of Turks who in the ninth or tenth century passed from the vicinity of Ghazni and colonised the country in question. They left their name in the district of Malistan, near Ghazni, where it remained to the present day.[*] They built several considerable towns, and for two or three hundred years maintained a certain degree of celebrity. Their name had since vanished from the country, and the towns which they founded were now in ruins. Their capital was *Ispenjwái*, or "the White District," and according to his view was the same as Shorawak, "the Salt District," which was in fact an equivalent name. Pishin was called *Afshíneh*. Quetta appeared under the name of *Shal*, which it retained to the present day. The tradition of the country asserted as an explanation of the name "*Shal*," that on the institution of the Afghan monarchy, the district of Quetta was assigned by the Duráni king in fief to the Khan of Khelat, on payment of a yearly offering of a shawl, and until lately he had always supposed that was the real origin of the name, but the tradition now proved to be untrue, since he had found that the place was called *Shal* as early as the tenth century. *Shalkot* had been mentioned by General Biddulph. *Kot*, he believed, was merely "the court-house," and Quetta was certainly a corruption of Kot. The other places named by the geographers in that district were *Mustang* and *Sibi*, and last of all *Sukíreh*, of which he did not know the position. He hoped that some day, when the country was more tranquil, the mounds in the Pishin Plain would be excavated. Some traces might then be found of the old Turkish tribe of *Válísh*, and of the coins which they used. He regretted that General Biddulph had not extended his paper a little, because he was the only senior officer of the expedition who penetrated far to the west. He had led an expeditionary column, indeed, across the Helmund, and if he had given a short account of the banks of that river, and of the ruins of Kileh-Bist, Bendi Timour, and other remarkable places in that vicinity, it would have been very interesting. However, what the paper contained was all new and valuable. All present would also have been gratified if he could have given a trace of the railway which was now in course of formation from the Indus to Candahar. He ventured to offer an opinion that that line and the other one on the east side of the country would probably be the two most valuable products of the Afghan war. In such countries, indeed, railways must be especially valuable, not only for purposes of military transport, but also in the larger interests of civilisation and commerce. As far as he (Sir Henry) knew at present, it appeared that the railway would ascend the mountains by Sibi, and not by Dadar and the Bolan Pass; it would then follow up the Nara River, and enter upon the plateau at Gwal. He believed it was intended to establish a large station at a place called Hurnai, near the head of the Nara, on the slope of the hills, above the hot plains of India, and yet not quite on the level of the plateau of Afghanistan. At that point it was also in contemplation to alter the railway from the broad to the narrow gauge. He would not at present risk reviving the old battle of the gauges, though he confessed he had an extreme horror of a break in the gauge, both as a military man and with a view to commerce. It was, in his opinion, the greatest misfortune that could happen to a railway. Still if, on economical grounds, there was no alternative, it must be put up with. Perhaps on some future occasion General Biddulph might be able to continue his observations on this interesting subject.

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[*] In the time of Hiouen-tsang (7th century A.D.), Fo-li-shi-sa-tang-na (*Valishistán* or *Valistán* of the Arab geographers, i.e. country of the *Valísh*) comprised apparently the upper valleys of the Helmund, the Arghendáb, and the Tarnak, the capital, called by the Chinese Hou-pi-na = Greek Cophen, being at the site now known as *Ulan-robát*. In the following century the *Válísh* moved south-westward to *Pishin*.

Sir Wm. Merewether said that in speaking of the communication between the Pishin Valley and India, General Biddulph had pointed out that the region he had explored was one of the old kafila routes for caravans. It was formerly a well-frequented route, but latterly had been abandoned, partly in consequence of the hostility of the tribes. There was, however, a very strong reason why it had not been followed of late years. In earlier times the capital of the Empire of Hindostan was Delhi, and naturally the products of Central Asia followed the shortest possible route to reach that city,—through Dera Ghazi Khan to Multan, and so on to Delhi. The capital of the Empire was now, however, London, and the consequence was that trade inclined more to the south, towards the nearest seaport, and followed the Bolan Pass. Even before the Empire of India became as it now is, it went by the latter route, because traffic would always take the shortest and most speedy way to its market, which now unquestionably was the sea coast. The seaport of Afghanistan was Karáchi. Since 1861, when Sir Bartle Frere first started the harbour works there, great improvements have been made at that port, and the harbour now was the only practicable one on the west side of India, except that at Bombay, which of course it was impossible that it could equal. It would no doubt be largely frequented in order to obtain the valuable commodities which would come down from Afghanistan when matters were settled in that country,—a state of things which, without encroaching on politics, all would agree with him in wishing might take place in a very near future. The River Indus was also a great advantage to the trade. Since 1839 steamers had been working on that river carrying the products up and down. In 1861 a railway was opened from Karáchi to Kotra opposite Hydrabad, connecting the Indus with the Port. More recently the railway communication had been extended up to Sukkur, which was on the right bank of the Indus, opposite Rori. It was part of the railway which was very aptly styled the "missing link." That link had now been completed, and there was railway communication from Karáchi right around to Calcutta. Lately a branch had been made from Sakkar (Sukkur) to Sibi. That was begun only at the end of last year, but it was now finished up to the commencement of the hills where the Nara River leaves them. The amount of energy and enterprise displayed in the execution of that railway could not be too highly extolled. More than a mile and a half had been laid per diem—a rate which was almost equal to some of the performances across the Atlantic. Having reached that point the question was whether the railway should be taken up the old route of the Bolan, or from Sibi up the valley of the Nara. All those mountain passes were river courses descending from high levels, and it was necessary to carefully examine the banks right up to the springs, or serious barriers might otherwise be encountered. The Bolan and the Nara ran quite parallel to each other, but the surveyors who were started from General Biddulph's column at Pishin found that the route by the Nara was a more gradual ascent, and at the end attained such a height that it would be more easy to get on to the plateau. The disadvantages of the Bolan were that at two points in the pass the route was very narrow, and when the water rose, it might come down with excessive force and carry everything away. For that reason he believed it had been decided by the Government of India to adopt the Nara line. As Sir Henry Rawlinson had stated, it was considered advisable to make the first part of the line broad gauge up to Hurnai. He considered that that was the proper thing to do. He had himself spent a year at Sibi, and he could safely say that it was without exception the hottest place he was ever in, and he never wished to see any large body of people placed there. An old proverb about Sibi was that so long as it was in existence there was no necessity for any hotter place. It would, therefore, be easily imagined that it would not be a good spot to which to consign Europeans. The broad gauge was at present expected to stop at Hurnai, but he hoped that such would not be the case, and that at any rate it would be carried on as far as Candahar, where the gauge might be broken for the present. During the time that he had been in Sind, over thirty years, he took the greatest interest in inquiring into the commerce that came down by the Bolan and other routes. A few days ago he had looked at some of his notes, and he found that in one year the wool alone brought down from Afghanistan amounted to sixty lacs of rupees—600,000*l.* In addition to that there were dyes, silks, and—what the poor, thirsty souls of Sind regarded as better than all else—exquisite fruits. Although for the present the railway was regarded as a military measure, it would, he hoped, before many years had passed, prove to be an exceedingly good commercial undertaking. It might not perhaps be a good investment for Englishmen's spare money, but he felt sure that it would yield some returns, and as trade gradually developed, would, in the end, pay a handsome dividend. He had been commissioned by the President to ask the Meeting to pass a vote of thanks to General Biddulph for the excellent paper which he had read, and for the valuable addition which he had contributed to geographical knowledge, and this he had much pleasure in doing.

Sir HENRY THUILLIER said he regretted that he had no practical knowledge of Afghanistan, because he had never been allowed to cross the frontier, but he had much gratification in testifying to the advantage which the officers of his old department in India derived from being under such an admirable general as Sir Michael Biddulph. He had it from the authority of the officers themselves, that the encouragement which they received from General Biddulph enabled them to do far more than they otherwise could possibly have done; and, in fact, the column under that General had done more surveying work than any other in Afghanistan. The Society must therefore feel truly grateful to a General who, amid all the responsibilities and arduous duties of his position, could think of the surveyors and send them out at every possible moment. He had received from India a map called "The Two Routes into Afghanistan, *viâ* Jalalabad and *viâ* Kurram." The map had not reached the Geographical Society from the India Office, but explorers in London had been able to ferret it out, and it was now on the table. It showed the large extent of new work executed by the survey officers during the present campaign, in contradistinction to what was before known; and it proved, as remarked by the President, that great modifications would be necessary in the map of Afghanistan. When Major Browne went out in 1877, before the war commenced, with the idea of laying a telegraph line to Khelat, he was furnished with all the information then obtainable with regard to the position of places and routes from Sind to the frontier, and he attributed to the data which were then furnished, much of the value of the work which the surveyors had been able to do by extending their triangulation from the Sind side, and by various other operations. The names of the officers who had so zealously performed their duty with the several columns were Major Maxwell Campbell, R.E., Captain Holdich, R.E., Captain Heaviside, R.E., Captain Woodthorpe, R.E., Captain Rogers, R.E., Captain Chas. Strahan, R.E., Major Tanner, Captain Gerald Martin, Lieutenant Hobday, Lieutenant Gore, R.E., Captain Beavan, and Lieutenant E. P. Leach, R.E., who was gallant enough to win the Victoria Cross and a brevet majorship. That was not a light thing to do whilst surveying a country. The Survey Department in India, when employed in an enemy's country, and beyond our frontiers, was not confined to military officers, and a civil officer, Mr. Scott, had performed most gallant deeds, on two occasions, worthy of the Victoria Cross. He believed his merits were now under the consideration of the Government and Council of India, and he hoped most sincerely that they would meet with the reward which they deserved. He had great pleasure in seconding the resolution for a vote of thanks to General Biddulph for the assistance he had given to topography and geography.

GEOGRAPHICAL NOTES.

Professor Nordenskiöld.—The celebrated Swedish explorer left Lisbon in the *Vega* on the 16th of March, with the intention, as we were informed, of paying a short visit to England on his way to Stockholm. He was expected to arrive at Portsmouth on the 22nd or 23rd; and arrangements were immediately made for giving him a suitable reception—at least such arrangements as were practicable at the season in which his visit was timed, i. e. the commencement of the Easter holidays. A deputation from the Society was appointed to receive him at Portsmouth, consisting of Sir George Nares, Commander Beaumont, and other Arctic officers, headed by Admiral A. P. Ryder; and a dinner in his honour, given by the President and Council at Willis's Rooms, was announced to take place on the 24th, at which, notwithstanding the very short notice, His Royal Highness the Prince of Wales had consented to take the chair. Unfortunately our preparations were rendered vain by the non-arrival of the *Vega*. At a late hour on the evening of the 23rd, the Managing Committee of the reception was compelled to issue an announcement that the dinner could not take place. Up to the hour of our going to press no news of her arrival on the coast has been received. The persistent easterly winds are believed to be the cause of the delay of the vessel.

Mr. Stewart's Journey from Lake Nyassa to Lake Tanganyika.—From Mr. James Stewart's report to the Foreign Secretary of the Free Church of Scotland, we gather some interesting details regarding the important journey which he has just performed almost at the same time as our own expedition. His starting point was Kambwe Lagoon, on the western side of the lake, 20 or 30 miles south of the point where Mr. Thomson left its shores for the interior, and his route for the first thirteen days was different from that taken by our expedition. Leaving Kambwe on the 14th of October with Mr. J. Moir, William Koyi, and a small party, Mr. Stewart reached the hills bounding the lake basin; after a march of eleven miles. He did not find the ascent from the lake plain to the plateau so steep, apparently, as Mr. Thomson did further to the north. He says that having previously traversed several of the passes to the highlands, this was the easiest of them all, and that a road would be quite practicable. He found the average elevation of the plateau stretching between the two lakes to be about 4700 feet above the sea. The rainfall of the country is large, and the climate cool and bracing. Cattle were found at almost every village, and sheep and goats are kept in large numbers. The route over the plateau that he followed was a remarkably easy one. It gradually rose from 3900 feet, near Nyassa, to 5400 feet on the ridge overlooking Tanganyika, but throughout the whole of it there was not one difficult ascent. Water is plentiful even in the dry season. On the 3rd of November he commenced the descent—2100 feet in fourteen miles—to Lake Tanganyika, reaching Pambete on the 5th, and finding there Mr. Thomson and his party, who had preceded him by only one day. The distance from Kambwe Lagoon to Pambete was found to be 254 miles. He remained here four days, and was able to secure fifteen sets of lunars to serve for fixing the longitude of the place, a great desideratum in the present state of our geographical knowledge of this important point in the African interior. He found Mr. Thomson had followed a much longer and more difficult route, having traversed a very rugged country, and crossed an elevation of 8000 feet. Both parties struck their camps at the same time, November 10th, Mr. Thomson marching northward, and Mr. Stewart returning to Lake Nyassa. His inquiries respecting the changes of level of Tanganyika led him to the conclusion that there was no evidence of a continued and gradual rise of the lake waters; there was a very high rise in the rainy season of 1873 (?), since which the annual rise has been lower than the maximum by some two feet six inches. He reached Lake Nyassa on his return on December 3rd, the homeward march being 232 miles, 22 having been saved by cutting off detours, and he thinks a little more might be saved in this way, but that 210 miles would be the shortest line that could be reckoned on between the two lakes. Livingstonia was reached in the lake steamer *Ilala* on December 20th. Mr. Stewart concludes by a brief description of the native tribes met with. They were friendly and peaceable, and one of them are industrious iron-workers. He had passed through the journey without a single day's illness, but his companion, Mr. Moir, had to return to Nyassa through lameness at an early stage in the journey.

Europeans on Lake Tanganyika.—The members of the London Missionary Society at Ujiji have founded a new station at Mtowa, on the western side of the lake, a few miles north of the Lukuga outlet. The whole party, consisting of the Rev. W. Griffith, and Messrs. Hutley and Hore, crossed in their little vessel the *Calabash* towards the end of October last, and having obtained the permission of the chief of the district, selected their site, and commenced building the first house. They have named the station Plymouth Rock. The country around is described as extremely picturesque; rounded hills, with numerous clear mountain streams flowing through the valleys rich in tropical vegetation. Mr. Robert Arthington, of Leeds, the originator of the Tanganyika mission, has offered to the Society a further contribution of 3000*l*. on the understanding that they will place a steamer on the lake, and explore the country lying between its northern end and Albert Nyanza.—M. Debaize, the leader of the important expedition supported by a grant of 100,000 francs from the French Government, died in Mr. Hore's house at Ujiji, after a painful illness, during which he was carefully tended by Mr. Hore, on the 12th of December. Previous to his illness M. Debaize was preparing for the continuation of his journey in a north or north-westerly direction, to explore the unknown region west of Lake Alexandra.—The missionaries of the Algerian party have established a station near Bihari in Urundi. Another death has been added to the numerous fatalities of this large party, viz. that of Père Ruellan, whose loss is much to be regretted, as he was an enthusiastic man of science, and accomplished as a surveyor. He died of typhoid fever at Tabora on the 24th of November.—The first station or civilising centre of the Belgian International Society has been established at Karema, on the shores of Tanganyika, in Ufipa, about 140 geographical miles south of Ujiji. M. Cambier arrived there with the first expedition on the 12th of August, and made a contract with the chief of Ufipa for a grant of land, and the construction of a number of houses. The whole of the stores of the first expedition, however, did not reach the place till the 15th of September. The settlement is built on a rounded eminence, forming a small promontory, rising about 20 feet above the waters of the lake. The progress of construction of the houses was slow, owing to the difficulty of procuring labourers, and the scarcity of useful timber in the neighbourhood. M. Cambier has since been reinforced by the arrival of the party with the two surviving Indian elephants, the others having succumbed to the fatigues of the long march.—By the last mail we learn that Mr. Hore was contemplating a voyage to the southern end of the lake, calling at the Belgian station, and then rounding the southern part, returning by the western shore. He was building a new half-decked boat for the cruize.

Matveyeff's Journey into Badakshan.—In vol. i. of the 'Proceedings' (p. 385) a brief mention was made of the scientific results of Colonel Matveyeff's expedition into Northern Afghanistan in 1878. The following further details of this exploration will be found interesting:—The expedition was organised under the command of Colonel Matveyeff, who, assisted by M. Schwartz, as topographer, and Lieutenant Trotzky, magnetic observer, and accompanied by seven soldiers and two interpreters, set forth from Samarkand with the intention of examining the passes leading into Kafiristan. Owing to the lateness of the season, the expedition had to abandon its intention of crossing into the basin of the Oxus by the Mura Pass, between Iskander Kul and the sources of the Karatag Daria, and to follow the usual route by Shahr, Yar-tube, Kalta-minar, Derbend, Baisun, Deh-i-nau, and Yur-chi. From thence the party appear to have struck southward, and passed over into Afghan territory at a ferry over the Oxus, called Kunduguzar or Kissar (query, Kunduz-guzar—ferry of Kunduz?), near Rustak. Here the authorities made some difficulty about granting permission for the expedition to proceed into Badakshan, on the ground of the late period of the year. Leave was eventually granted, but the Russians state that they were purposely conducted along unfrequented paths over the mountain range lying on the north side, instead of along the usual route, which appeared to be perfectly practicable at Faizabad (visited by no European since the time of Wood). The party learnt that the passes into Kafiristan, which are barely practicable for horses even in summer, were then wholly blocked by snow, and as the route to Kabul was closed owing to the war, the expedition had no resource but to return by way of Mashad, Talikhan, Tash-kurghan, and Mazar-i-Sharif. The Oxus was crossed at Patta-kuzar (Kissar), and the party returned to Samarkand by way of Shirabad, Khuzar, and Shahr. The results of this important journey comprise a route-survey, the determination by astronomical observations of several positions in Afghanistan, a batch of magnetic observations, barometric height determinations, and a junction of the Russian and English surveys in those regions.

Kafiristan.—Dr. H. W. Bellew, C.S.I., has contributed to the last published part of the 'Journal' of the United Service Institution of India a paper on Kafiristan and the Kafirs, based to a considerable extent on notices scattered about in the works of native historians, which are of importance as the record of (in several instances at least) actual visitors to the country. Dr. Bellew says the Kafiristan of the present day is about 150 miles in length by some 50 or 60 miles in breadth. On the north it is bounded by the Hindu Kush, on the east by the Chitral River down to Chaghansaree, or even Kunar, while the southern boundary may be defined as a line along the hill-skirts north of Lughman, and across the several valleys opening into the basin of the Kabul River; on the west it is bounded by the Nijrao and Punjshir valleys. Within these limits the length of the country lies obliquely from north-east to south-west, and its greatest breadth is due east and west across its central part. The whole area is mountainous, and furrowed by a succession of long winding valleys, each of which has its own system of branches and glens ramifying into the recesses of the mountains, where they are mere torrent gullies, flanked by precipitous cliffs, and encumbered by huge rocks and boulders. As these torrent gullies expand into glens they form sheltered nooks and corners, and present small surfaces of level ground, and lower down where the glens open into the main valley, there are here and there stretches of plain and meadow land, but these are everywhere much encroached upon by the spurs projecting from the hills on either side. The main valleys, Dr. Bellew notes, are separated by impassable mountain ridges, so that their inhabitants are cut off from free communication with one another, and hence arise their peculiarities of language and manners. There are four of these main valleys, of which the largest is called Kamdesh, and with its tributary valleys and glens occupies nearly half the area of the country. It is drained by the Kama River, which joins the Chitral near Kunar, and this is the only true Kafiristan completely inaccessible to strangers. The other valleys, which drain into the Kabul River, are, in their lower parts at least, in more or less free communication with the neighbouring Mahommedan tribes. During summer the rivers are at times impassable for days together in their lower courses, where usually they are crossed on inflated skins, while higher up rope-bridges or beams are laid across from rock to rock. The mountains of Kafiristan are described as extremely steep and rugged, and forming an intricate network of spurs, among which even the natives sometimes lose themselves. Among the productions for which Kafiristan is noted are white and red wine and mulberry bread. Owing to the nature of the country, cultivation is necessarily limited, but every available piece of ground is taken advantage of, and carefully terraced into narrow slips of field against the steep hill slopes. The principal crops are wheat, barley, millet, and Indian corn; rice is also cultivated in the lower valleys, and in the more elevated glens, where corn is raised with difficulty, the amaranth, or cock's-comb, is cultivated for its seed, which is ground into meal for winter use. The Kafirs subsist largely on dried fruits, milk, curds, cheese, and ghi, and they also eat freely of flesh, but never touch fish, fowls, and eggs. They possess cows and sheep in great numbers, while in the higher parts are found the domestic yák, and vast flocks of goats. Besides bears, leopards, wolves, foxes, &c., there are found in the hills the ibex and markhor, the musk deer, and a species of wild sheep, probably *Ovis Ammon*. As regards climate, the winter in the lower valleys, though severe, is hardly rigorous, while the spring and autumn are delightful seasons; the summer is said to be at times oppressive. In the higher and more northerly parts of the country, including the Hindu Kush, there are properly only two seasons, both severe; spring and autumn are very short. The Kafir people, so far as Dr. Bellew can learn, have no national name for themselves as a collective people or for their country; they distinguish themselves by the name of their proper tribe. Of the thirty-five principal tribes Kámojí is the most important, and that name is sometimes used to designate the whole Kafir people. The only form of government in the country consists in a sort of patriarchal control exercised by certain chiefs, or heads of families, called Sàbonnash, whose power, however, is very limited.

The Climate of Western Japan.—Among the reports from Her Majesty's Consular officers in Japan, recently published by the Foreign Office, is one by Mr. James J. Enslie on the Niigata district, which furnishes some interesting information respecting the climate of a region on the western coast of the main island of the Japanese group. The Niigata *Ken*, it may be well to premise, extends from 37° 15′ to 38° 30′ N. lat., and from 137° 30′ to 139° 40′ E. long., and comprises the province of Echigo (except the small district of Fongawa) and the island of Sado. Its area is said to be not quite 6000 square miles, the greatest length being 210 miles, and the extreme breadth 47 miles. Portions of this *Ken* are very mountainous, but an extensive, sandy, clayey plain, irrigated by several large, though shallow, rivers, stretches back some 25 miles inland from the sea. Numerous gold, silver, copper, lead, and coal mines are said to exist in the mountains, but only two appear to be worked at present. In referring to the matter of climate, Mr. Enslie remarks that the numerous tea plantations which exist in the immediate neighbourhood of Niigata, prove the fallacy of the idea that tea-plants cannot be reared with profit beyond 36° N. lat. The south-west winds in summer create a slight current setting north, and thus cause an increased temperature. The winter generally commences in December with north and north-west winds, followed by heavy falls of snow, and gradually decreasing temperature, which is at its minimum towards the end of January or early in February. Then come warmer days, the thermometer frequently registering 6° to 9° R. (45°·5 to 52°·8 F.) at midday, followed by heavy snowstorms from the north and north-west, which continue till the end of March, when the spring may be said to have set in. This season of the year is generally genial, with a clear or slightly cloudy sky, though stormy, cold weather is sometimes experienced. From the middle of May till the end of September the weather is warm, if not hot, the prevailing wind being south. Thunderstorms and heavy falls of rain are not uncommon in July and August; a rainy season is unknown in this neighbourhood. From October the weather is cold and changeable, with south-west winds. The snow which covers the ground to a depth of from four to eight feet, is undoubtedly a great protection to the tea-plants against the more severe cold of midwinter. This covering is speedily melted away by the warmer south winds of spring, and while gradually disappearing, it refreshes the budding plants. The soil of this part of Japan is a chalky clay, and the tea-fields, situated on the upper slope of an immense plain, extending seaward from the range of mountains some 25 miles from Niigata, are well irrigated by large streams. The more noteworthy features, then, in the climate of this part of Japan, and which appear to be favourable to the growth of tea, are as follows:—An absence of intense and continuous cold, ample water supply, and fine, sunny spring weather, unaccompanied by night frosts, continuous summer heat with refreshing rain, and a temperately warm autumn, during which season the tea-plants are in full blossom.

Ascent of Chimborazo.—We learn from the *Presse* of Vienna, that Mr. Edward Whymper, with his Italian guides, the two Carrels of Val Tournanche, has succeeded in reaching the top of Chimborazo. The peak, according to Von Thielmann's measurement, is 20,703 feet high; according to Dr. Reiss 20,697 feet. This is the highest point yet attained in the Andes. The climbers started from a tent pitched at an altitude of 17,150 feet. Owing to the cold, the wind, and the rarity of the air, the difficulty of the ascent was greater than had been anticipated. Five hours, it is stated, were spent in climbing the last 1000 feet. The thermometer on the top marked 21° Fahrenheit (11° of frost). The peak of Illimani, ascended in 1877 by M. Wiener,* is some 600 feet lower in height than Chimborazo.

Projected French Expeditions.—Some important expeditions are shortly to be undertaken by French travellers, under the auspices of the Ministry of Public Instruction, in accordance with arrangements lately made by the "Commission des Voyages et Missions Scientifiques." M. Désiré Charnay will revisit Yucatan to make further archæological investigations there, and to photograph buildings, bas-reliefs, and inscriptions. M. de Ujfalvy is commissioned to visit Southern Russia,

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* 'Pérou et Bolivie, par Charles Wiener' (Paris, 1880), p. 407.

North-western Persia, the Turkoman country, the basin of th
Oxus, and Afghan Turkistan, his ultimate destination being t
Plateau. M. de Ujfalvy, whose journey is expected to last two
to make investigations into the geography, anthropology, ethn
archæology, and natural history of the regions mentioned. M
de Saint-Pol Lias and E. de la Croix are entrusted with an
mission to Sumatra for the purpose of making researches
ethnography of the island; and lastly, Dr. Jules Crevaux wil
take a fresh journey of exploration in Equatorial America
Buenos Ayres and the Amazons. As it is expected that the
incurred by the expeditions of MM. Charnay, Crevaux, and de
will be too considerable to be borne by the means ordinaril
disposal of the Ministry of Public Instruction, an application
made to the Chambers for a special vote on their account.

Proposed Medals for the Reward of Naval Officers (not Survey Officers of Marines who may make useful Surveys.

A proposition has recently been made to the Council, by Admiral A.
having for its object the encouragement of non-official surveying by offi
Navy, not engaged in surveying ships, who may have opportunities of in
and drawing charts of localities likely to be useful to navigators. The s
propounded in the following letter of Admiral Ryder to the Council:—

5, Victoria Street, Westm
Dec. 7, 1879.

I have the honour to request that you will submit the following prop
consideration of the President and Council of the Royal Geographical Socie

I have long been of opinion that inability to make a nautical survey of
a shoal, or a coast-line is a great drawback to a naval officer's usefuln
inability was very common among the former navigating class, and also a
of the present day, the lieutenants N. and sub-lieutenants N.; and almos
among other executive officers, unless they have had the good fortun
served in surveying ships. I hold it to be indisputable that a *fair* nautica
may be ordinarily regarded as certain to be a *good* navigator, especially
pilotage in very narrow waters. A naval officer who is a nautical su
gained thereby *two* points; he has acquired (*a*) a knowledge of ready pil
aided by books of sailing directions, or by chart, and using bearings, ang
by both combined; (*b*) he has qualified himself for the conduct of nauti
and re-surveys which are constantly required in many parts of the world
when hostilities are being carried out or imminent. I hold that a kn
practical nautical surveying is one of the "accomplishments" which the
should require of a naval officer, and that the absence of a good *practical* [
from scientific] knowledge should tell against his rapid promotion, as
knowledge of *seamanship*, *steam*, *gunnery*, and *navigation*. As young off
present regulations pass for *lieutenants* at nineteen, and are declared co
rise without further examination to the highest ranks, it is necessary th
here anticipate the criticism that will inevitably be made on my sug
assumed to be that a knowledge of practical surveying is proposed to b
the various subjects a thorough acquaintance with which is now expected

It has long been expected that a change will have to be made, and that all midshipmen, instead of, as now, passing for *lieutenants* at *nineteen* (the age at which their brothers in the Church, the army, the law, and medicine, are just *commencing* their technical studies), will, while continuing to pass in seamanship, navigation, gunnery, and steam at that age, pass for *sub-lieutenants* only, and not for lieutenants' commissions, and that they will have to pass for *lieutenants* at twenty-two—the age at which in all other scientific professions the *final* examination takes place—and that among the numerous subjects, viz. advanced knowledge of nautical astronomy, advanced knowledge of steam, advanced knowledge of tactics, advanced knowledge of gunnery and of torpedoes, advanced knowledge of naval prize law, and of court-martial practice, which *sub-lieutenants* will be expected to "pass in" for lieutenants at twenty-two, last, but not least, will be nautical surveying. As a naval officer I attach the chief importance to the above consideration, viz. the making all young executive officers efficient pilots and navigators; but I also desire that my brother officers should be encouraged to give their attention to further the objects of the Royal Geographical Society, and on this subject I hope for the sympathy and co-operation of the Council. I therefore submit for the consideration of the President and Council the following proposal, which I make with the view of encouraging young officers of the ranks of commanders (in gunboats), lieutenants, sub-lieutenants, and midshipmen, and officers of marine artillery and marines, to occupy their very considerable amount of spare time in harbour and at sea in making *fresh surveys* or *re*-surveys of harbours, shoals, coasts, &c.

The proposal is that the Council of the Royal Geographical Society accept from me the cost of offering one gold, one silver, and one bronze medal every year to officers of the above ranks who shall submit to the Council the three * most deserving surveys made and projected by themselves, with the necessary sailing directions, meridian distances, and meteorological observations, &c. I have taken special care that this medal shall not be mistaken for that highly honourable distinction the Royal Geographical Society's gold medal, although some of the recipients of the former may hope some day to aspire to deserving the latter also. The said charts to be invariably sent through their immediate superiors (if the officers who make the surveys be on *full* pay) for transmission through the Secretary of the Admiralty to your office if their lordships' permission be obtained for this course; otherwise direct to your office. It being distinctly understood that if the charts be engraved and published by the Admiralty, or by the Royal Geographical Society, no responsibility whatever as to the accuracy of the information is taken either by the Admiralty or by the Society, and that this be stated *distinctly* and *conspicuously on each chart.* It may fairly be anticipated that the Royal Geographical Society, if it adopt this suggestion, will by so doing give so great an impulse to the acquirement by naval officers of a knowledge of nautical surveying, that after a little time the true geographic spirit will be much more widely awakened in the Royal Navy than at present. The race of naval men who have done so much for geography, independently of their service in the Royal Navy—Clapperton and Tuckey, Lyon and Cameron, Cochran and Smyth, Franklin and Parry, Julius Baker and Musters, and a host of others—will henceforth be easily continued and replenished by volunteers. Valuable surveys and re-surveys will reach England every year from all quarters of the world, executed by amateur (*qua* surveying) naval officers on distant naval stations where there are no surveying ships, or any prospect of them.

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* No one would be entitled to receive more than one medal of each description; but if the officer who produces the best survey of the year is already a medallist he might receive from the Royal Geographical Society a certificate notifying the fact, and on the medal he has already received would be engraved the years in which he wins this extra distinction. The bronze medal would most frequently be won by the junior officers.

The intrinsic value of a gold medal, the size of a doubloon, is 3*l.* 15*s.*; of a silver medal the size of a dollar, 4*s.*; of a bronze medal the size of a dollar 1*s.*, together 4*l.*; there would also be a small expense for engraving the name of the recipient on the rim of the medal. 100*l.* invested at 4 per cent. would meet the demand. Mr. Wyon showed me some years since the *die* of one of your medals which he thought would be suitable. I shall be glad, if the Society should welcome my proposal, and adopt it (subject, of course, to such changes as to details as may be agreed on), to pay 100*l.* to the Society for the above purpose. The best *practical* marine surveyor I ever met in our service, and who instilled a love of the science into all of his young subordinate officers, was the late Lieutenant Bird Allen, R.N., who was first lieutenant with Commander Richard Owen in H.M.S. 'Thunder' in the West Indies, 1833–6, and died as commander of H.M.S. 'Soudan' in the Niger expedition, 1840. I should like the medals to be called the *Bird Allen Medals for Nautical Surveys*. The present Hydrographer, Captain F. I. O. Evans, C.B., and I were youngsters in H.M.S. 'Thunder,' and I feel assured that he will welcome any well-considered proposal to stimulate the acquirement of a knowledge of marine surveying among the young officers of the *general* service, provided no responsibility be incurred by the Admiralty as to the *accuracy* of the surveys referred to. That the name of our revered friend Bird Allen should be connected with this medal will not, I am confident, diminish the favourable consideration with which the Hydrographer may be disposed to regard the proposal. I have lately returned from being Commander-in-Chief in China and Japan for three years. Had a knowledge of practical marine surveying been as common as it was rare among the commanders, lieutenants, and sub-lieutenants, considerable additions might have been made to our geographical knowledge on that station, much of which requires re-surveying, much of which is unexplored, or as regards large extents of coast-line, is in that dangerous half-explored, non-surveyed state so fatal to numerous ships.

Alfred Phillipps Ryder, F.R.G.S., Admiral.

The Secretary, Royal Geographical Society.

The Council referred the subject to the Scientific Purposes Committee, who, after giving their best consideration to the proposal of Admiral Ryder, came to the conclusion that the Royal Geographical Society was scarcely the body to undertake such examinations and administer such rewards as proposed. The views of the Committee having been confirmed by the Council, a copy of the following minute was sent to him on the 30th January:—

"While entirely concurring in Admiral Ryder's view as to the importance of encouraging naval officers in making surveys, the Committee are of opinion that the Council of the Royal Geographical Society could not properly discharge the duty of adjudicating medals which he wishes them to undertake. They suggest that the Royal Naval College, or some similar institution connected with the Admiralty, would be better able to carry out such a system of honorary rewards as Admiral Ryder proposes."

REPORT OF THE EVENING MEETINGS, SESSION 1879–80.

Seventh Meeting, 23*rd February*, 1880.—The RIGHT HONOURABLE THE EARL OF NORTHBROOK, G.C.S.I., President, in the Chair.

PRESENTATIONS.—*Edward Haggard, Esq.*; *Iyesato Tokoogawa*; *Kingo Takemura.*

ELECTIONS.—*William R. Arbuthnot, Esq.*; *George Batley, Esq.*; *Edward Haggard, Esq.*; *Frederick Hill, Esq.*; *Hastings Charles Huggins, Esq.*; *James Jackson, Esq.*; *R. Lesslie, Esq.*; *Desmond McCarthy, Esq.*; *Lionel Kentish Rankin, Esq.*, B.A.; *Henry Charles Stephens, Esq.*; *Kingo Takemura*; *Iyesato Tokoogawa*; *Octavius Toogood, Esq.*

The PRESIDENT explained that the first business for the evening was the discussion of a communication from Mr. Hore, giving further details respecting his recent visit to the Lukuga outlet of Lake Tanganyika, and that Sir Fowell Buxton had kindly undertaken to read the communication to the Meeting.

THE OUTFLOW FROM LAKE TANGANYIKA.

Sir FOWELL BUXTON said it would be difficult to find any lake which had been more productive of curious problems than Tanganyika. It was discovered by Captain Burton in 1858, and that gentleman, as well as others who had since visited it, noticed the curious currents which prevailed in its waters. When Dr. Livingstone was on the lake in 1869, he believed that it communicated with the Albert Nyanza and thence with the Nile, but his journey to the north end of the lake in company with Mr. Stanley showed that the supposed channel of connection was not an outflowing channel, as had been supposed, but an inflowing river. No other outlet was heard of or suspected, and the question remained unsolved. Dr. Livingstone, although he had, in his different journeys, gone nearly all round the lake, could discover no outflow at all, and he appeared to incline to the supposition that there was no outlet. He reported that there was a prevalent tradition on the shores of the lake that there was no outflow, but that, on the other hand, the surface of the lake was continually rising, and he saw stumps of trees which apparently had been killed by the rising of the water. No doubt many present had seen along the edge of some Scotch lake, which had been artificially dammed up, a fringe of dead pine trees; such was the phenomenon that he reported. Lieutenant Cameron visited the lake in 1874, and nothing could be more clear and precise than his account of the Lukuga creek, and the strong current which he observed flowing from the lake. That appeared to settle the question, but Cameron also heard reports of the surface of the lake rising year after year. The next visitor to the lake was Mr. Stanley, on his second journey, in 1876, and there certainly were very strange differences in the appearance of the lake as described by him and by Lieutenant Cameron. Cameron found the outlet from the lake to be about 300 or 400 yards wide: Stanley put the width at 2500 yards. There must, therefore, have been some very strange alterations in the appearance of the creek during the two years' interval. Stanley went up the creek to a considerable distance, and was firmly convinced that there was no outlet at all. He tested the current by observing the direction of the flow of bits of wood. It was not his (Sir Fowell Buxton's) business to go into theories, but certainly the differences between Stanley's and Cameron's accounts were very curious in their bearing upon the physical conditions of that region. The communication which he was now about to read consisted of extracts from Mr. Hore's diary. The author was one of the agents of the London Missionary Society. He had received some instruction in scientific observations before his departure for

Africa, and although making no pretension to being highly trained, the evidence that he afforded amounted to this, that, while he was there, there was a very strong and powerful river flowing out from the lake. He crossed the lake from the missionary station at Ujiji, in a little vessel belonging to the mission, in May 1879. His diary ran as follows:—

"Wednesday, May 7th.—Calm nearly all day. By Thursday morning, however, I was well over towards Cape Kungwe—strong breeze came on from south, and we stood across to Uguha, with the wind and sea abeam—a hard day. About 2 P.M. we had got so far across that I was able to keep away and run straight for the Lukuga, which I was able to recognise by Cameron's map. Ran right into the Lukuga at 5.30—three to five fathoms [deep] at entrance. As the river narrowed we found ourselves rapidly swept in (one requires to be rather lively here), and made the boat fast alongside, about one mile inside.

"Called on the chief, Kawe Nyangwe, who was friendly at once. He is a tall, lively, cheerful fellow, and, as far as I can judge, his character corresponds with his appearance. There is no gloomy mystery about him. He puts all questions in a straightforward way—does not beg; but when asked, expressed his desire to become possessed of some civilised sort of clothing and to see and hear all the wonderful things of the Wasungu. Having, through the kindness of the chief, secured the services of a fine, active, intelligent guide, one Mtweta My-y-ya (whose spear, with two carved female figures, I have sent home), I started on Saturday morning to explore the river. Mtweta brought with him three little lads and a large pot of pombe; nor would he provide other food, though he knew my intention was to stop away all night; Faragalla, who accompanied us, also neglected to provide food. Notwithstanding my protestations, they both anticipated they would tire me out and return the same evening; they were both taken in considerably.

"We descended by boat to Stanley's farthest, the rapids beyond being dangerous for our canoe. Here Mtweta thought I should give in, but, landing, I directed them to prepare for the march, which they all did unwillingly; however, at last, finding I was determined, they started, first mooring the canoe and hiding the paddles and the precious pombe in the grass, doubtless expecting to return in the afternoon. Going about half a mile, passed the River Rabamba (Stanley did not pass here); several good views of the river along the road; the rapids are only about half a mile, then the river widens as before, gently winding; at about two miles and a half on road, River Msengeli; two more miles, an empty village, and then the River Kawindi; one more mile, River Luaminwa.

"Soon after passing the Kawindi, the three lads put their loads down and declared they would go no further. Mtweta doubtless thought this would stop me, but I was determined to ascend the Kiyanja ridge to see the river and to get latitude, so I shouldered one of the loads, and Mtweta was manly enough, when I put it to him in that way, not to 'break his agreement,' and so he, Faragalla, and myself proceeded alone, Mtweta shortly afterwards taking my load in addition to his own; but still I had much trouble to urge them on. We were not going along a road which, he said, led to a fisherman's camp, but to get to the ridge we must leave this road and strike across country. This Mtweta hesitated to do, hoping to the last that I might give in; but late in the afternoon, finding he was in for it, we left the road and struck straight across for the Kiyanja. In the valley between we crossed the Luaminwa again, a most refreshing little stream, and struggling through the jungle, reached the base of the Kiyanja ridge. The ascent was very, very steep, a climb in fact, necessitating frequent rests, but each halt brought us to a more extensive and glorious outlook than the last, and my little kettle of cool water (which I was carrying myself) afforded excellent refresh-ment. At about 800 feet I selected a camping place, and the men made me a little hut and collected firewood. I mounted afterwards about 300 feet higher and saw the Lukuga flowing far into Urua. I got bearings, and at night the latitude, which, with the latitude at Kawe Nyange, will enable me to make a decent plan of the river. It would have served the men right to let them hunger, for it was all their own fault. I had told them to bring food. Mtweta wandered about and picked up a few seeds, which he chewed; but they both looked so miserable that I gave them a small allowance from my own food, which consisted of cold maize porridge and cold roast fowl. The hill is covered with the same quartz and mica with which the sands of the little river below sparkle and glitter. From our camp there is a very fine and extensive view. The lake, itself distant, is bounded beyond by the lofty peaks of Kungwe. The reaches of the Lukuga lay at my feet, as on a plain, and sweeping round the foot of this, Kiyanja, become lost to the view westwards among the hills of Kwa Mekito and Kalumbi's in Urua."

Sir Fowell, in conclusion, said that no one could help admiring the accurate observation as well as the pluck and determination of Mr. Hore, and he was sure all present would congratulate the London Missionary Society on having such an agent in Africa.

Commander Cameron said this was a question in which he was naturally most interested. Mr. Hore had with great kindness written direct to him, telling him that he had proved the Lukuga to be really the outlet of Lake Tanganyika. It is not many years ago since nothing was known of Tanganyika except vague rumours of a large lake in the interior. Livingstone, travelling about in the south, had heard of it, but the discovery of the lake was reserved for the greatest African explorer now living, Captain Burton, in 1858. On February 3rd of that year Burton and Speke arrived on its shores. Burton was then suffering from paralysis, and Speke was almost blind. Neither was wanting in energy or indomitable courage, but fortune was against them. Burton in consequence of his paralysis remained behind at Ujiji, while Speke went across to the Kasenge Islands, and only missed finding the outlet by five miles. Their thermometer was out of order, and Speke, who was a most accurate and careful observer, fixed its level at 1844 feet. Burton collected from the Arab traders a mass of information, which he (Commander Cameron) afterwards found perfectly correct. He was not sure that Speke, who had a sort of natural instinct in geographical matters, felt perfectly satisfied that there was no outlet, but Burton was inclined to that view, and considered that there might be some peculiarity about the salt in the water which rendered it inappreciable to the taste. In 1859 the verdict of all geographers was that there was no outlet to the Tanganyika. In 1867 Mr. Finlay read a paper before the Society, in which, by comparing the levels obtained by Speke at Unyanyembe with those obtained during his second journey, in which he was accompanied by Colonel Grant, and with the levels obtained by Sir Samuel Baker, he came to the conclusion that the level of the Tanganyika was 2800 feet above the sea, and 124 feet above the Albert Nyanza. Baker at that time had gleaned information from the natives which led him to conclude there was some connection between the Albert Nyanza and the Tanganyika. There was therefore some reason for the theory that then found favour, of a connection between Tanganyika and the Nile. On the 2nd April, 1867, Dr. Livingstone reached the south end of Tanganyika, and calculated its level at 2700 feet above the sea, and, as he only knew of Speke's calculations and nothing of Mr. Finlay's rectification, he concluded it must be another lake connected with Tanganyika by a series of rapids. He afterwards wandered away to the west, and discovered Bangweolo and other lakes. In February 1869 he again returned to the Tanganyika.

He was then broken down by illness; he had no medicines or supplies, and was dependent on friendly Arab merchants. His usual habits of accurate observation were affected by his illness, and he had then been without news from home for three years, and was anxious to get to Ujiji. Travelling northward along the western shore of the lake, he would, of course, have discovered the outlet, had he not embarked in a boat just south of the Lukuga at six o'clock one evening, and passed the outlet in the middle of the night. Returning from his westward journey to Nyangwé, he arrived at Ujiji on the 23rd October, 1871, and on the 28th he was found and relieved by Stanley, whose arrival put new life into the veteran explorer, and he started with Stanley to the north to examine the supposed outlet towards Albert Nyanza. When they reached Rusisi, they found that it flowed into the lake, and the question of the northern outlet was once for all settled. This happened in the beginning of the month of November, and on the 29th November Livingstone wrote, "The outlet of the lake is probably the Lugumba," a river which he had seen much of in his journey to Nyangwé. After the departure of Stanley, as we all know, he travelled down the south-eastern shores of the lake. He thought that, as many people supposed the Rikwa Lagoon to be the head-waters of the Rufigi, it might prove to be the outlet, but he found no connection between Tanganyika and the Rikwa. Thus Livingstone had travelled round nearly the whole coast of Tanganyika without learning anything of its real outflow. The next stage in the history of the question was his own (Commander Cameron's) arrival on the shores of the lake in February 1874. Believing that the northern half had been fully settled by Livingstone, Stanley, Speke, and Burton, he decided to go round the lake in a southerly direction, and search in every hole and corner until he found a river flowing out. If he failed to find it there, he intended to examine in the same way the northern half. He started with a couple of canoes, and, after working round the south end, he came to the Lukuga Creek. In his journal he wrote that he entered the Lukuga at 11.40; that the current was flowing from the lake, and that it apparently fell into the Lualaba near Nyangwé. The entrance was more than a mile across, but was closed by a grass-grown sand-bank, with the exception of a channel 300 or 400 yards wide, across which there was a sill where the surf broke heavily at times, although there was more than a fathom of water over its shallowest part. The next day he proceeded three or four miles down the river until navigation was rendered impossible in consequence of the masses of floating vegetation. The depth inside the sill was three, four, and five fathoms—three fathoms close alongside the grass which barred his progress. He wanted the chief to commence cutting a road, but could not succeed in persuading him. On his return to Ujiji the Arabs said that his account of the outlet could not be true, and the number of men he had with him was utterly inadequate to the task of cutting a way through the obstruction in the river, and they would not accompany him because it was not regarded as a road along which any man travelled. Next came the visit of Mr. Stanley to the Lukuga, in 1876. Mr. Stanley's account of it is as follows:—"Before starting from Zanzibar I had heard that Cameron had discovered the outlet of Lake Tanganyika in the Lukuga River, which ran through Uguha to the west, and was, therefore, an affluent of Livingstone's great river. In Commander Cameron's book, vol. i. p. 305, the following sentences bearing upon what he personally saw of the Lukuga are found, 'In company with the chief I went four or five miles down the river until navigation was rendered impossible owing to the masses of floating vegetation. Here the depth was three fathoms; breadth, 600 yards; current, one and a half knot, and sufficiently strong to drive us well into the edge of the vegetation. I noticed that the embouchures of some small streams flowing into the river were unmistakably turned from the lake, and that wood set in the same direction.'" Of course the mouths of small rivers flowing into another river were turned into the direction of the main current. Mr. Stanley then said:—"In opposition to these statements of Cameron's, was the evidence taken by me at Ujiji. Para, his guide, said that the white man could not have seen the river flowing towards Rua, because it did not." This Para was a very plausible fellow, and when he (Commander Cameron) went down the river, he left him behind, so that Para himself did not go down. Mr. Stanley then says:—"Ruango, the veteran guide, declared that he had crossed it five times, that it was a small river flowing into Tanganyika, and that if I found it to flow in a contrary direction, he would return me all his hire. Natives from the Lukuga banks whom we found in Ujiji, asserted positively that there were two Lukugas, one flowing into Lake Tanganyika, the other into Rua." Mr. Stanley also stated that several Arabs who had travelled across the Lukuga declared that "until the white men had come to Ujiji, they had never heard of an outflowing river, nor did they believe that there was one." He also said that, "A suspicion that there was no present outlet to the Tanganyika had crept into my mind, when I observed that three palm-trees that had stood in the market-place of Ujiji in November 1871 were now about 100 feet in the lake, and the sand-bed over which Livingstone and I took our morning walks was over 200 feet in the lake." On the 16th of July he sailed up the creek, and described the mouth as about 250 yards wide, narrowed after a mile to 800 yards, and after another mile to 400 500 yards. "Upon rounding the point of land upon which Mkampemba stands I observed that the water changed its colour to a reddish brown, owing to the ferruginous conglomerate of which the low bluffs on either side are composed. This was also a proof to me that there was no outflowing river here." Then he tried an experiment, and a log of wood floated 822 feet towards the lake in one hour and forty seconds. Afterwards, in the afternoon, it floated 159 feet in nineteen minutes and thirty seconds; and Mr. Stanley regarded that as conclusive proof that there was no current from the lake at that date, adding:—"I am of opinion that, after taking all things into consideration, that Kahangwa Cape was at a remote period connected with Kungwé Cape on the east coast; that the Lukuga was the affluent of the lake as it stood then; that the lake was at that period at a much higher altitude than it is at present; that the northern half of the lake is of a later formation, and that, owing to the subsidence of that portion and the collapsing of the barrier on the Kahangwa Cape and Kungwé Cape ridge, the waters south emptied into that of the deep gulf north, and left the channel of the Lukuga to be employed as the bed of the affluents Kimba and Lumba, or the eastern slope of the Kiyanja ridge to feed the lake. But now that the extension of the profound bed, created by some great earthquake, which fractured and disparted the plateau of Uhha, Urindi, Ubembé, Goma, &c., is on the eve of being filled up, the ancient affluent is about to resume its old duties of conveying the surplus waters of the Tanganyika down into the valley of the Livingstone, and thence, along its majestic winding course, to the Atlantic Ocean." Mr. Stanley, therefore, at that time said that the river had not in later geological periods flowed out of the lake, but that some person who came afterwards might find it flowing out. He (Commander Cameron) thought that anyone who considered the question of the rainfall, and calculated the number of rivers which flowed into the lake at the south end, would come to the conclusion that even if the lake was drained dry it would within less than a year be filled again. Another curious thing was that the natives would tell a traveller that there was no river when the waters were covered by masses of floating vegetation. Baker, during his journey up the Nile, met with enormous difficulties through this habit of African rivers. The aquatic vegetation was strong enough to bear almost any weight when it was at its prime. It took seven, eight, or nine years to reach its greatest strength, and, after remaining two or three years in that state, it afterwards decayed, and in course of time was swept away. The rivers, ninety-eight in number, which he (Commander Cameron) enumerated as emptying themselves in the southern portions of the lake, no doubt varied from year to year in the amount of water they brought down. When he (Commander Cameron) saw, in the Lukuga, the *Sindy*, as the accumulation of aquatic vegetation is called, there was a current of water flowing underneath it. Perhaps when Stanley saw it the mass had settled down to the bottom, the lake being then at its lowest level. The *Sindy* might then have been about to decay, and succeeding rainy seasons may have cleared it out entirely, and formed the swift flowing river which Mr. Hore had described.

The PRESIDENT said they must all feel that this was a very important question in physical geography, and that real benefit had been done to the science by the communication which had been read, and the very impartial explanation given by Commander Cameron. He then called upon Dr. Emil Holub, who had on a previous occasion read a paper before the Society, to make a few supplementary remarks regarding the country visited by him on the Upper Zambesi, which he had not time to enter upon on the former occasion.

The Marutse-Mabunda Empire of the Upper Zambesi.

Dr. HOLUB began by expressing his thanks to the President and the Council for the great honour shown to him by permitting him to deliver a second lecture. On the last occasion he felt sorry that time did not allow him to bring before them the whole subject of his explorations in South Africa. He had to omit a description of the Makalaka country to the west of Matabele-land, which, although it had been traversed by other explorers, had never been properly described. He had taken the liberty of calling it the South African Switzerland. It was a most picturesque, hilly region, watered by the River Maijtengue. There was another very interesting country south of the Victoria Falls, which he had taken the liberty of naming Albert-land. His object on the present occasion, however, was to give a description of a large native kingdom in South Central Africa, a kingdom which had been traversed before him by Livingstone, and after him by Major Serpo Pinto. The empire extended from 17° south latitude, and 23° east longitude, to about fifty miles above the junction of the Chobe and the Zambesi, then down the Zambesi about 360 miles east of this junction, and from the above point northwards to beyond the junction of the Liba and Kabompo. When he questioned the king as to how far his kingdom extended to the north, he said his men might go five days to the north before they met other tribes, from Vanke's town five days, and from Sesheke twenty days. As the natives travelled about eighteen or twenty miles a day, an idea might be formed as to the size of the empire. To the east were tribes called the Bamashi, ruled by three kings. To the north and north-east were some most interesting tribes called the Mashu Kulumbe, under ten kings. The kingdom which he was about to describe was called that of the Marutse-Mabunda. When Livingstone passed through those parts, the Makololo were the governing tribe, but they had now ceased to exist. Both the Marutse and the Mabunda belonged to the same family. On his journey he found traces of native tribes who were living in former centuries, but had since been nearly extirpated, it being the practice of the South African tribes, when they conquered a country, to kill all the men, take the women, and educate the children as warriors. After the extirpation of the Makololo, the king of the Marutse took possession of their country, and on the death of the king of the Mabundas the two kingdoms were united under its present name. The kingdom was inhabited by eighteen different tribes, speaking as many different dialects.

These again were split into no less than eighty-three sub-tribes or clans. To the east of the Marutse, and about thirty miles above and below the junction of the Zambesi with the Chobe, there was a tribe called the Masupia. North of the Marutse on both banks of the river was a tribe known as the Mankoë, the most beautiful of all the tribes belonging to the Banthu family. Where the Kabompo joined the Zambesi, was a tribe of expert fishermen called the Mamboë, who had been transplanted to several parts of the Zambesi, so that they might supply the royal residence with fish and hippopotamus meat. To the north of the Marutse and the Mankoë a vast country was inhabited by the Mabundas. East of the Mabundas the Mabimbi. Near to the Victoria Falls were the Batoka; east of them the Malonga and the Manansa; and still further east the Makalakas, of whom there were two tribes, one on the banks of the Zambesi, and the other on the River Kasha. All the other tribes lived among them in villages, and possessed small pieces of ground. The most noteworthy geographical feature in the empire was the Zambesi. The bank of that river towards the east was hilly. Towards the north and centre the country became a high plateau, and the southern part of Barutse was also very hilly. In the flats between the hills the Zambesi formed large lakes. In the hilly southern region of Barutse there were many rapids and a few cataracts. Still, the most striking feature of the Marutse empire was the inhabitants. When he crossed the Zambesi and entered into their country, it seemed to him as if he had left Africa, for the tribes were entirely different to the others in South Africa. They belonged to the Banto family, but in their appearance, customs, and workmanship they were entirely different from the other members of the family. The tribes composing the Marutse empire had their own civilisation independent of influence from white men, whilst other tribes had nothing which could be called a religion. The Marutse believed in a Supreme Being, and in a life after death. It took him a long time before he found out that they had a religion. They had so great an idea of the Supreme Being, that they did not like to pronounce his name. He was, however, called N'yambe. When he talked to the king about this subject, and asked him whom he meant, he replied, "He who lives in the blue sky." When a man was killed by a buffalo, a crocodile, or an elephant, the common expression was, "N'yambe has ordered it, and it is no use resisting." When a little girl was taken by a crocodile, and three days after a portion of her body floated on the river, they said, "N'yambe has ordered it: as she has been killed by a crocodile, she must remain to be eaten by a crocodile," and they refused to bury it. When a member of the royal family was ill, he was taken to the grave of one of his ancestors: the king then knelt on the grave, and prayed to the deceased, "You, my grandfather, who are near to N'yambe, pray to N'yambe that the disease may be taken from this man." Many of the graves of the chiefs of the Masupia were adorned with ivory tusks, and when a great disaster happened, such as the Chobe overflowing its banks, the Masupia gathered round the graves of the chiefs, and prayed, "You who are with N'yambe, pray for us." These, and many other things which he had noticed, proved their belief in a Supreme Being and a future state. Many of the tribes of South Africa buried their dead at night so that no man or evil spirit might know where the graves were, but the Masupia planted a kind of *nux vomica* tree on the grave, so as to mark the spot. Another difference between them and the other South African tribes was that the king was assisted by a Great Council and a Privy Council. When a man was thought to be guilty of a crime that deserved capital punishment, his case was submitted to the Great Council, but unfortunately the present king had abolished those laws. In order to make himself king, he had killed his two brothers, and to maintain himself in power he continued to do injustice. Formerly, when a person was accused of a capital offence he had to drink a cup of poison. If he vomited it up again, he was declared innocent; but if he fell down senseless, he was burned. Under Sepopo's *régime*, however, a great many had died after the poison had had no effect upon them; and the reason why the people endured the king's cruelties was that among them were many old men who knew something about *materia medica*, and the king was regarded as the head of these "magicians." The people therefore regarded him as having supernatural powers. It happened, however, that he once practised the charm openly. He condemned some important headmen to death, but the executioner was afraid to take their lives, and gave them warning. They ran away during the night. The day after, when the king heard of it, he declared he could bring them back at once. He had a bullock killed. The fat of the heart was cut into small pieces, and these pieces were put in the clefts of some split sticks, which were ordered to be put before the houses of the runaway chiefs. The king declared that this would make them all stupid, and that they would return the next day and sue for pardon. Nothing of the sort happened, and the scales fell from the eyes of the people. The Marutse and Mabundas were superior to all the other South African tribes in their clothing, their working in ivory and metals, and their customs generally. They carried on a lively trade with other tribes to the north, and traded also in corn, ivory, and indiarubber with the tribes to the west. Their mental abilities were also far superior to those of the more southern tribes. They cultivated music, and the king was always accompanied by his musicians, while every boy had a kind of concertina, or some other instrument. The women were held in high esteem. The law of the country was that the best of everything belonged to the king or queen, and the chiefs would refuse presents from travellers for fear that they might be killed if they were found with anything better than the king possessed. Ivory was very plentiful, and the country had never been devastated by the slave trade. Some of the Marutse had slaves who had been taken in war, but they treated them very kindly. In their method of catching crocodiles they showed considerable ingenuity. To an iron hook was attached about twenty strings, made of different materials, fastened to a bundle of reeds. The bait having been set, the crocodiles seized it at night, and the strings between their teeth prevented their closing their jaws, so that the water rushed in, and they were drowned in their own element. Next morning the natives would go down the river in their canoes, and find the bundle of reeds lying near one of the banks, and so get the crocodile. He hoped that very soon this part of Central Africa would be opened to trade. He made the acquaintance of queen Moquai, and impressed upon her mind the power she possessed to improve her subjects. He, however, on one occasion found that she condemned a young girl to be dipped under water till she was nearly dead, because she would not consent to marry the man chosen for her by the queen.

Sir H. Rawlinson proposed a vote of thanks to Dr. Holub. He said, he had in his experience met with many classes of travellers, but Dr. Holub was one of the best specimens of the best class. He did not travel for the mere sake of locomotion, to collect sensational anecdotes, or even to professionally survey the countries through which he passed. He had observed everything which came within his ken, and his accounts of his experiences were replete with interest and information. He was not a stranger to the *literati* of Europe. Before he returned from South Africa his ethnographical researches were published in Vienna, and it was a great honour to the Geographical Society to have been the means of introducing him to the notice of the public of England.

Colonel Grant seconded the motion. He said this was the first occasion on which he had had an opportunity of seeing Dr. Holub, and he had had great pleasure in listening to his remarks. He could bear testimony to his high qualifications, and he wished him all success in his next visit to Africa.

Sir H. Barkly said he was glad of this opportunity of adding his testimony to that of Sir Bartle Frere, as to the admirable qualities which had been displayed by Dr. Holub during his residence in South Africa. It had not been his good fortune personally to make his acquaintance, as he always happened to be absent from the Diamond Fields when he (Sir Henry) visited them, but he had heard nothing but what redounded to his credit. He had had some correspondence with him about the slave trade in the interior, and had forwarded the information received from Dr. Holub to Her Majesty's Government. It would be well if all travellers had the same spirit of humanity combined with energy, and he was quite worthy of all the support and encouragement which the Royal Geographical Society could give him.

The President said it might be some consolation to Dr. Holub to know that what had happened to the young girl who had been almost drowned in the river, was only an illustration of the old Scotch system of the ducking stool, in which the refractory female was immersed in water a certain number of times, and brought out before any fatal consequences ensued.

Eighth Meeting, 8*th March*, 1880.—Major-General Sir Henry C. Rawlinson, K.C.B., Vice-President, in the Chair.

Presentation.—*Charles Clauson, Esq.*

Elections.—*Captain W. E. Armit; Henry C. W. Becher, Esq.; Charles George Brown, Esq.; The Earl of Charlemont; Staff-Commander William Burgess Goldsmith; Herbert Alfred Hammond, Esq.; James Hobday, Esq. (Beng. Staff Corps); Edward Horace Man, Esq.; Jacob Montefiore, Esq.; Henry James Moxon, Esq.; St. John Stephen, Esq.,* B.A.; *Albert Adolph Ludwig Straube, Esq.; Gilbert Venables, Esq.,* B.A.

The Chairman read to the Meeting a letter recently received from Mr. Thomson, the commander of the East African Expedition, giving an account of his journey from Lake Nyassa to Lake Tanganyika (*ante*, p. 209). He also read a telegram received from Dr. Kirk on the 1st of March, stating that Mr. Thomson had left Ujiji on the 16th of January, and would return home viâ Uguha, Uhehe, and Kilwa. In commenting upon these reports, the Chairman said that the Society would await with great interest further details of Mr. Thomson's successful journey. So far as he was able to form an opinion the Expedition had been eminently successful, under the leadership of the young geologist who had succeeded to the command after the lamented death of Mr. Keith Johnston, and who had fully justified the hopes that were entertained when he was appointed as Mr. Johnston's assistant.

Commander Cameron, referring to Lake Hikwa, said all travellers in Eastern Africa had heard of a great lagoon to the eastward of Tanganyika, which in the rainy season was a large lake and in the dry season a marsh. When he was on the Tanganyika he heard that it drained into that lake. But he was rather inclined to think that the name was a generic term for intermittent lakes. He was glad to hear from Dr. Kirk's telegram the confirmation of the news that the Lukuga was the outlet of Tanganyika.

Sir Rawson-Rawson said it would interest the Meeting to know that on the very day that Mr. Thomson arrived at the end of Lake Tanganyika, Mr. Stewart and one of the missionaries of the Scotch mission arrived there also from the north-west of Lake Nyassa, but by a different route, showing that the road between Nyassa and Tanganyika was almost a highway, that it was easy to travel, that the people were friendly; although, on account of the high ground, which Mr. Thomson mentioned as ranging from three to five and seven thousand feet, it might not be practicable to run a railway between the two lakes. As regarded the character of the natives, there was a fair prospect of carrying on traffic between the two lakes, and so really connecting the two long stretches of navigable waters in Central Africa.

Captain C. E. FOOT, R.N., said, that during a recent journey into Central Africa which he had undertaken he had very little opportunity of doing much geographical work, his object being chiefly to ascertain what were the prospects of trade in the interior. He started from Zanzibar on the 1st September, and arrived at Mpwapwa in fourteen marching days from the coast. He was a little too late to meet Captain Carter in charge of the King of the Belgians' elephant expedition, but he heard a good deal of them, and saw the Algerian Roman Catholic mission. First he passed a large party with the porters who were marching up from Bagamoyo, and afterwards came upon the advanced party, who thought that they had done a good march in getting up in twenty-one days from Bagamoyo with their mules. After remaining a few days at Mpwapwa he visited the lakes Nzui and Kiaragai, and on his return journey he visited the Uguru Hills, about 100 miles from the coast. Those hills were remarkably picturesque. One morning whilst on the march, he arrived at a break in the jungle where there was one of those beautiful glades which frequently were met with in East Africa, forming a perfect park. It reminded him very much of Madeira. His interpreter came up, and he said to him: "What do you think of that?" The man had been a sailor, and like all sailors of course had visited the Seychelles, and his reply was, "It is very like the Seychelles." It was a glorious scene. From the top of the range of hills he looked down upon a vast sea of trees, with here and there a boulder or a small rocky mound. He got down to Saadani in nine days, and visited Dar-es-Salaam, and then had the great pleasure of going up the road that had been constructed entirely by Sir Fowell Buxton and Mr. William Mackinnon. Some years ago, in addressing the Society, he said that the whole territory belonging to the Sultan of Zanzibar was improving, and his recent visit was entirely for the purpose of seeing what was being done for Africa, for he firmly believed that it was only by legitimate commerce and civilisation that the slave trade could be stamped out. By means of the road which had been formed, the natives were becoming acquainted with the value of money, and were beginning to work for money. The road was a very good one—far better than many in Natal and Zululand, from whence he had just returned. He thought there would be no difficulty in driving a tandem up the road. It was now some 50 miles in length. He did not know whether it would be continued to Nyassa or run along the seventh parallel of latitude. He himself wished that the latter course might be followed, because he had a letter from Captain Carter in reply to his from Mpwapwa dated Unyanyembe, 1st November, in which that gentleman said he hoped on his return to the coast to push along the seventh parallel of latitude. That would strike Mr. Mackinnon's road from Dar-es-Salaam, where there was a harbour suitable for the repair of small vessels. Massani Bay was accessible to all vessels of all sizes at all times.

The following paper was then read:—

"A Voyage along the Coasts of Norway and Lapland." By Lieut. G. T. Temple, R.N. The paper and the discussion which followed will appear in the May number.

PROCEEDINGS OF FOREIGN SOCIETIES.

Geographical Society of Paris.—February 6th: M. Grandidier in the Chair.—The Chairman announced the receipt of a telegram from Zanzibar with the melancholy news of the death at Lake Tanganyika of M. Debaize, the leader of the French expedition to Central Africa. The deaths at Tabora of two members of the missionary party were also announced, viz. MM. Ruellan and Fassy.—The arrangements for the reception of Professor Nordenskiöld at Paris were then explained. The Society had invited the provincial geographical societies and other scientific bodies of Paris to send delegates for the occasion. The reception would take place, in the first instance, at the railway station. There would then be a special meeting at the Sorbonne, and afterwards a banquet.—It was announced with regard to the scientific instruction given to intending travellers, that the Council had decided to award a special certificate to all students who had gone through the course of instruction at the Montsouris Observatory, and been passed as able to take observations and make astronomical computations.—News of the Philippine travellers, MM. Montano and Rey, was communicated to the Meeting, to the effect that these gentlemen had returned from their visit to the province of Albay, where they had made a great number of observations in anthropology.—Brief announcements regarding the expeditions of Mr. Thomson in Central Africa, and M. Dechy in Sikkim were made.—A letter was read from MM. L. Bert and G. B. Blane respecting the recent volcanic eruption in the island of Dominica.—A letter was also read from M. Dufour, who had reached Walfish Bay on his journey of exploration to Damaraland.

February 20th: M. Grandidier in the Chair.—A note communicated by M. Loeb on the Daggatun, a tribe of Jewish origin living in the Sahara, was read.—M. Daubrée read a letter from Professor Nordenskiöld, enumerating the various collections made during his recent expedition. They were as follows:—1. A very rich collection of invertebrate animals made in dredging by Dr. Stuxberg, zoologist of the expedition. To judge by these dredgings, the fauna most rich in species, at depths of from 15 to 50 fathoms, is not in tropical seas, but in the Arctic zone and Behring Sea, where the temperature of the ocean depths is always one or two degrees below the freezing point. 2. A collection of flowering plants, lichens, and algæ, made by Drs. Kjellman and Almquist. 3. Sub-fossil bones of whales from the Tchuktche Peninsula, and bones of the *Rhytina Stelleri* from Behring Island. 4. Fossil tertiary plants from Nagasaki and Labuan. This collection will afford illustrations of the climatic condition in former geological times of the Equatorial zone, and also of the centres of distribution of the present flora. 5. Stone implements, utensils, arms, and clothing of the Tchuktches and Esquimaux, who have now in use at the same time the stone axe and the Remington musket. This collection contains also drawings, engravings, and sculptures in fossil ivory, which bear much resemblance to similar objects found in palæolithic caves in France. 6. A collection of 1040 works in nearly 6000 volumes from Japan, printed and manuscript, executed before the opening-up of the country to Europeans. More than half the works contain illustrations full of instruction for those studying the arts, handicrafts, old customs, &c., of this people.—Immediately on the arrival of the *Vega* at Stockholm, the working out, with a view to publication, of the vast material brought home by the expedition, will be taken in hand—the observations in meteorology and magnetism, in hydrography, geology, and the various departments of biology.—A letter was read from M. Montano, dated from Sulu, December 31st, 1877, giving an account of the dispossessed pirates, called *juramentados.* The Spaniards, since the suppression of the pirates, seem decided to install themselves permanently at Sulu. The old town (Soung or Tianggi) seen by Dumont d'Urville, and Wilkes exists no longer; all that remains are a few piles seen at low water, sole remains of the town after the bombardment of the 29th February, 1876. M. Montano believes that the new town is destined to become a flourishing colony.

March 5th: M. GRANDIDIER in the Chair.—Among the donations, especial attention was called to M. Tardieu's French translation of Strabo, the third and last volume of which had been sent to the Society. Among the other merits of this work were its extreme cheapness, and the scrupulous care with which the translator has profited by the restitutions made to the Greek text by recent critics.—Dr. Harmand announced that the inscriptions collected by him on his recent journey in Indo-China had been in great part deciphered by Professor Kern, of Leyden. The alphabet employed, if not for all the inscriptions, at least for a large number, is the *Kawi*, the same that was used in the old system of writing in Java; the language used is Sanskrit. For other inscriptions, *Kalinga* characters are used, but there are some written in a language which is unknown to Professor Kern, although he knew the characters in which they were written. These discoveries throw light on the connection which formerly existed between Indo-China and Java.—A letter (dated Panamá, February 5th) was read from Lieutenant Wyse, giving an account of the engineering operations on the line of the proposed interoceanic canal. The soundings, except one taken near the mouth of the Rio Grande, had proved the existence of a stratum of alluvium much thicker than that shown in the geological section submitted to the Paris Congress. A considerable economy in the excavations would result from this circumstance. With regard to the Chagres River, the source was at present unknown, but it issued from the south-western flanks of a lofty peak not far from the northern coast of the isthmus; the stream then describes a great bend before discharging its waters into the Caribbean Sea. The same dominant peak gives rise on the south to the *Pacora*, and on the south-east to the *Mamoni*, a tributary of the Bayano. It is probable that the *Mandinga* also has its source in this singular watershed, but on the northern slope. The health of the members of the expedition was excellent.—A letter was read from Mr. E. Gilbert, French Consul at Damascus, on the peoples composing the Vilayet of Damascus.—In conclusion, a communication was read on the cartography of Indo-China by M. Dutreuil de Rhins.

Geographical Society of Berlin.—March 6th, 1880: Dr. NACHTIGAL, President, in the Chair.—The President informed the Meeting that the Swedish traveller, Dr. Nordenskiöld, who had been elected an honorary member of the Society, found himself unable for the present to accept the invitation that had been sent to him, to deliver a public address in Berlin, as he could not deviate from the arrangements made by the Swedish Government for his return journey; but he hoped to be in Berlin in the course of August next, on the occasion of the congress of anthropologists in that month. Dr. Nachtigal next referred to the successful ascent of Chimborazo recently accomplished by Mr. Whymper in the company of two Swiss Alpine guides; adding that, although Jules Remy claimed to have performed this feat in the year 1856, the truth of his report seemed doubtful for more than one reason, since, according to the latest observations, the summit of this giant mountain is more than 1000 metres lower than the height assigned to it by Remy, who stated it to be 7328 metres (24,043 feet). Dr. Reiss trigonometrically determined its height to be 6310 metres (20,703 feet), and his companion, Dr. Stübel, who ascended the mountain on the north side to a height of 5810 metres (19,062 feet), reports that the summit of Chimborazo forms a crater filled with snow.—The President also alluded to the completion of the St. Gotthard Tunnel, and to the exertions of M. de Lesseps in furtherance of his project of an interoceanic canal through the isthmus of Panamá.—A detailed report had been received from the German traveller, J. M. Hildebrandt, who, assisted with funds by the Royal Academy of Sciences, has undertaken the exploration of Madagascar. The report gives a description of an excursion made for the purpose of ascertaining the facts connected with the assassination of the Bremen naturalist, Dr. Ch. Rutenberg, in August 1878. On the 15th June, 1879, Mr. Hildebrandt left the island of Nosi-be in a schooner hired for the purpose, and proceeded along the west coast of Madagascar as far as the small village of Beravi (not marked in the English Admiralty chart), inhabited by Sakalava, visiting on his passage the villages of Norontsánga and Monjangá. At Beravi, where he landed on the 7th July, he succeeded, after long delays, in securing the necessary number of porters for his journey inland. On his march he touched at the Sakalava villages of Ansahafi, Ansunáki, and Merulúfa, and after following the course of the Rano-bé River, he arrived at the hamlet of Pevata, situated upon the margin of a broad desert track which separates the coast Sakalava from those inhabiting the interior. Having crossed this neutral desert ground, he at last reached the hamlet of Beléi, where, after persuading the natives that he had come on a friendly errand and not for the purpose of avenging the death of Rutenberg, he prevailed upon them to conduct him to the place where Rutenberg was murdered in his sleep and his body cast into the river. After his return to Nosi-be, our traveller occupied himself with arranging and packing the rich zoological, botanical, and ethnographical collections (the latter including a number of Sakalava skulls), the greater part of which has already safely arrived in Berlin. The weather towards the end of 1879 and at the commencement of 1880 rendered further excursions impossible. Between the 9th and 12th January a violent hurricane raged at Nosi-be (Bar. 29·614 in.), accompanied by torrents of rain (in the space of three and a half days the rainfall amounted to 28·24 in.), which caused great damage, and interrupted all communication. Mr. Hildebrandt intends at the end of the rainy season, about the middle of March, to return to Beravi, and hopes from thence to reach the capital Antananarivo by a southern circuit.—The taxidermist to the Royal Zoological Museum submitted to the Meeting a large series of zoological and botanical preparations, preserved by a new process invented by him. He insisted upon the importance of his discovery to travelling naturalists, especially in tropical regions, where prepared specimens often decay in a few hours.—Herr von Möllendorf gave a description of his journey from Peking to the Wutai-Sha Mountains, which had not been previously attempted, and illustrated his discourse with accurate surveys made by him on this occasion.—The meeting concluded with an address by Herr Flegel on his sojourn in the Delta of the Niger and on Mount Cameroons, and his excursions on the Binue River.

Danish Geographical Society.—At the meeting of February 17th, at which the King and other members of the Royal family were present, Captain A. Mourier gave an account of some of the results of the *Ingolf* expedition * of last summer to the coasts of Greenland. He stated that the correctness was established of Professor Mohn's theory that the ice-cold water of the sea-bottom never passes the submarine heights stretching from the Faroe Islands to Iceland, and that the depth of the sea was found to decrease considerably in about N. lat. 67°, where it varied from 150 to 200 fathoms, and large icebergs were met with. Further to the eastward the temperature of the deeper water rose gradually, while on the surface the rise was sudden, in one case from 1° to 7° C. (33°·8 to 44°·6 F.) in an hour; in a distance of five miles the depth of the sea increased from 160 to 505 fathoms, and in the Gulf Stream to 1005 fathoms. Among the chief results of this expedition are the mapping of previously unsurveyed portions of the east coast of Greenland, and the discovery of an immense bank running from the north-west coast of Iceland almost to the Greenland coast, and helping to keep the cold polar streams from the Atlantic.

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* See p. 79.

NEW BOOKS.

(By E. C. Rye, *Librarian* R.G.S.)

EUROPE.

Burat, Amédée.—Voyages sur les Côtes de France. Paris (Baudry): 1880, 8vo., pp. 327, pls. (*Dulau*: price 16*s.*)

This work adds to the practical accuracy of modern hydrographic surveys the historical interest afforded by a study of the geological and other physical aspects of the existing conditions on the coasts of France, based upon many personal expeditions with that object by the author, and illustrated by reproductions of engravings from the official 'Pilote français,' and by full-page engravings from photographs of details of the chief localities. Some of the latter deserve especial commendation.

Simons, Theodor.—Spanien. Berlin (Paetel): 1880, Lieferung 1, fo., pp. 16, pls. (*Williams & Norgate.*)

The commencement of a descriptive account of Spain, to be profusely illustrated by Professor Alexander Wagner of Munich, and completed in about 30 parts, price 2*s.* each. If the promise of the first part be maintained in its successors, this work will probably rank as the best of its kind upon the country.

ASIA.

Ujfalvy de Mezö-Kövesd, C. E. de.—Expédition scientifique française en Russie, en Sibérie, et dans le Turkestan. Vol. IV. Atlas anthropologique des Peuples du Ferghanah. Paris (Leroux): 1879, large 8vo., pp. 16, 63 photographs, map. (*Williams & Norgate*: price 1*l.* 18*s.*)

This volume, published in anticipation of vol. iii., contains a collection of anthropological types of eleven races of the people of Kokand, and is especially intended to illustrate vol. i. of the work. (See 'Proc. R. G. S.,' 1879, pp. 77, 405.) An ethnographical map of the Pamir region is added.

Leclerq, Jules.—Le Tyrol et le Pays des Dolomites. Paris (Quantin): 1880, 12mo., pp. 273, map. (*Williams & Norgate*: price 2*s.* 6*d.*)

The map (no scale) covers the Dolomite region of the Œtzthal, Meran, Botzen, Bruneck, and Cortina. The book has no specialty beyond serving as an introduction to tourists.

Wheeler, J. Talboys.—A short History of India and of the frontier States of Afghanistan, Nipal, and Burma. London (Macmillan): 1880, cr. 8vo., pp. 744, maps. Price 12*s.*

This work, by the late Assistant Secretary to Foreign Department of the Government of India (also late Secretary to the Government of British Burma), is an entirely independent one, being taken from official records and similar reliable sources. Commencing with the Mahá Bhárata epic, the main features of the history of the various dynasties are given to the present time, and the different territorial outlines are given in 13 coloured maps.

AFRICA.

Conring, Adolph von.—Marroco, das Land und die Leute. Allgemeine geographische und ethnographische Verhältnisse, Verfassung, Städte, Land, Bewohner, Handelsbeziehungen, Produkte, Politische Verhältnisse, Europäer und deren Vertreter. Berlin (Hempel): 1880, cr. 8vo., pp. 334, map, plan. (*Williams & Norgate*: price 8*s.*)

This work, resulting from the German Embassy to Morocco in 1877, is written more in the style of a gazetteer than a narrative of personal experiences. It contains an account, worked up to date, of the physical, political, and historical aspects of the kingdom, especially as regards its relations with European powers. The plan shows the city of Morocco and its vicinity (scale 1 : 110,000); the map is a mere sketch, scale 1 : 2,000,000.

Holub, Emil.—Sieben Jahre in Süd-Afrika. Erlebnisse, Forschungen und Jagden auf meinen Reisen von den Diamantenfeldern zum Zambesi (1872–1879). Lieferung 1. Wien (Hölder): 1880, 8vo., pp. 32, pls. (*Dulau.*)

The commencement of the German edition of the traveller's book, to be completed in about 30 parts, at 6*d.* each, and published at fortnightly intervals. Five parts have as yet appeared, reaching to Dr. Holub's experiences among the Batlapins, and an English translation will be published by Sampson Low & Co. The engravings are from original sketches.

Ribeiro, Manuel Ferreira.—As Conferencias e o Itinerario do Viajante Serpa Pinto atravez das terras da Africa Austral, nos limites das Provincias de Angola e Moçambique, Biè a Shoshong: Junho a Dezembro de 1878. Estudo critico e documentado. Lisboa (Cruz & C^ia.): 1879 on title, 1880 on cover, 8vo., pp. 901, two maps.

Señor Ribeiro, in this unprecedented volume of analysis and criticism, devotes some 315,000 words to a description of the accounts which have as yet appeared in newspaper reports, &c., of the journey of Major Serpa Pinto across Southern Africa, being apparently unaware of the existence of the scientific observations taken by the traveller, or of the map now preparing under his personal instruction, and without waiting for the publication by him of the book descriptive of his travels, of which preliminary announcements have been made.

The chief errors indicated are the delineation (on Serpa Pinto's map published in the Portuguese journal 'Occidente,' No. 37, of 1st July, 1879) of a non-existent river Québe, disemboguing at Novo Redondo (this would seem to be merely another name for the Cuenge of our older maps); the exact course laid down for the Cubango, which the traveller never explored, or even saw, being 300 miles from its chief stream; the erroneous supposition that geographers had attributed a southern direction to the Kokema, which was well known to flow to the north; the wrong name of Makarikari, instead of Karri-Karri, given to the salt lake exactly placed on Sá da Bandeira's map of 1867, and the omission of one of its affluents (the prefix Ma, it should be observed, is merely the plural form, covering the group of lakes or pans of that name); the attribution of insalubrity to Mossamedes, which is the most healthy place in West Africa, and the only one where the European race is perpetuated; the statement as to many cataracts existing on the Zambesi, whereas there are only small falls and rapids; the disappearance of the well-known Ba-Kololo, called Makololo by Serpa Pinto; the expression "secret" of the Cubango, whereas it was well known to many geographers, and is well shown on the map of Petermann and others; the supposed discovery of the well-known Kalahari desert; the "complete study" of the Upper Zambesi, which the traveller never explored; the assertion that Bihé is the best centre for West African colonisation, without precise preliminary climatological researches; the astonishment recorded at the well-known disappearance of large bodies of water in the dry season; the wrong explanation of the failure of water in 'Ngami, its emptying by the Zuga, and the confusion in the description of its marshy region; the description of the country between the Zambesi and Limpopo, known since 1864; the evident confusion of the affluents on the right bank of the Zambesi; the erroneous connections between the Cubango and Congo, Zambesi and Congo, and Cubango and Zambesi; the inexact description of the region below 12° S. lat.; the omission of Kabatsa; and various other faults of omission and commission, chiefly based on descriptions of places not visited, too great trust in native information, and perfect ignorance of the works of predecessors.

Señor Ribeiro, however, allows the traveller such glory as the mere performance of a great and heroic feat can confer.

Apart from the purely personal criticism, Señor Ribeiro gives in the third section of his first part, pp. 327–602, a chronological account of travels in this portion of Africa, chiefly by Portuguese, which will probably be found of greater interest than his strictures on the various reports of the journey of the particular explorer which he discusses.

The maps are those of Ladislas Magyar, Petermann (Jan. 1879), the '*Occidente*' one above mentioned, and that from our own 'Proceedings' of August last.

Riddel, A.—A Grammar of the Chinyanja Language, as spoken at Lake Nyassa, with Chinyanja-English and English-Chinyanja Vocabularies. Edinburgh (Maclaren): 1880, 16mo., pp. 150.

The author, who served in the capacity of agriculturist in the Livingstonia Mission from May 1875 to February 1879, and was thus brought into contact with the Anyanja, was compelled from want of interpreters to collect the material forming the base of this little publication, the only existing one on its subject (except Blair and Procter's Manganja vocabulary).

AMERICA.

Gravier, Gabriel.—Étude sur une Carte inconnue, la première dressée par Louis Joliet en 1674, après son exploration du Mississipi avec le P. Jacques Marquette en 1673. Paris (Maisonneuve): 1880, sm. 8vo., pp. 49, map. (*Dulau:* price 4*s.*)

This extract from the memoirs of the Congress of Americanists (Brussels Session, 1879) by the President of the Norman Geographical Society, contains a coloured facsimile of Joliet's map above mentioned, which practically covers North America as known in 1674. Joliet appears to have made several copies, differing somewhat considerably in nomenclature and outline, and all of which are unpublished, though the rough sketch by his companion Marquette has four times been printed. This map is the first of the copies above mentioned, and is supposed to be the first map containing the outline of the great lakes and the course of the Mississippi. No trace of its history is given; it has been acquired by M. Ch. Leclerc for the Maisonneuve library.

GENERAL.

Egli, J. J.—Etymologisch-geographisches Lexikon. Separat-Ausgabe des lexikalischen Theils der "Nomina Geographica, Versuch einer allgemeinen geographischen Onomatologie." Leipzig (Brandstetter); 1880, sm. 4to., pp. 644. (*Williams & Norgate:* price 12*s.*)

This portion of the author's great work above named (published 1870–1872) is now published separately, and as its title implies, contains the derivations of such geographical names as are capable of being traced, with a short reference to the discovery of the places which they respectively represent, and of the published authority referred to in each case.

Embacher, Fritz.—Die wichtigeren Forschungsreisen des neunzehnten Jahrhunderts in synchronistischer Uebersicht. Braunschweig (Vieweg): 1880, 4to., pp. 47. (*Dulau*, price 4*s.*)

These useful tables contain in parallel columns the dates of the chief voyages of discovery in the whole world, with the travellers' names and the localities referred to. Thus Africa, being divided into West and East, and subdivided into North-west, Tripolitania, and South-west, and North-east and South-east with the Cape region, can be examined for any special travel with great ease, the voyages of the same date being so arranged across the page as to come in line, though in different regions, and all being placed chronologically. References are given to Petermann's 'Mittheilungen' for the various routes.

Guthe, H.—Lehrbuch der Geographie. Vierte Auflage, wesentlich umgearbeitet von Dr. Hermann Wagner. Hannover (Hahn): 1879, 8vo., pp. 1030, tables.

The comprehensiveness of the work for purposes of instruction may be inferred from the fact that the Editor occupies 16 pages in explaining the specialities of this edition; 15 more pages are taken for the table of contents. Political

and historical geography receive considerable attention in it, and the
recorded practical events in any way bearing on geography are given in c
logical order, from the time of Sesostris to Nordenskiöld, with similar
retical treatment from Moses downwards. There is a good index.

Lombard, H. C.—(Climatologie médicale.) Atlas de la distribution géograp
des maladies dans leurs rapports avec les climats. Paris (Baillière): 1880
pp. 19, maps. (*Williams & Norgate:* price 10s.)

Consists of 25 coloured maps, with explanatory text, showing the mo
and quarterly distribution of mortality in France and Switzerland, and i
ferent countries, and of the greatest and least European mortality, the dis
tion of malaria, yellow fever, pulmonary phthisis, cholera, leprosy, dys
and hepatitis, in various parts of the globe.

Ritter.—"Was bedeutet Carl Ritter für die Geographie?" Festrede zur Säcul
am 11 October, 1879, von Dr. F. Marthe. Berlin (Reimer): 1880, 8vo., pp.

NEW MAPS.

(By J. Coles, *Map Curator* R.G.S.)

WORLD.

Berghaus, Dr. Hermann.—Map of the World, containing the lines of O
Mail steam communication and Overland routes, the international, aerial, an
marine Telegraphs, and the principal tracks of Sailing vessels; showing
Continental surface characteristics, the Oceanic currents and important De
Soundings; with 33 additional Charts and Plans showing the general Curre
air, and the lines of equal magnetic variation, the Tehuantepec, Honduras,
ragua, Panamá, Darien, and Suez routes, several sea-ports; the telegraphi
steam lines round the world. 9th Edition. Justus Perthes, Gotha,
8 sheets and explanatory notes. Price 13s. (*Dulau.*)

ARCTIC REGIONS.

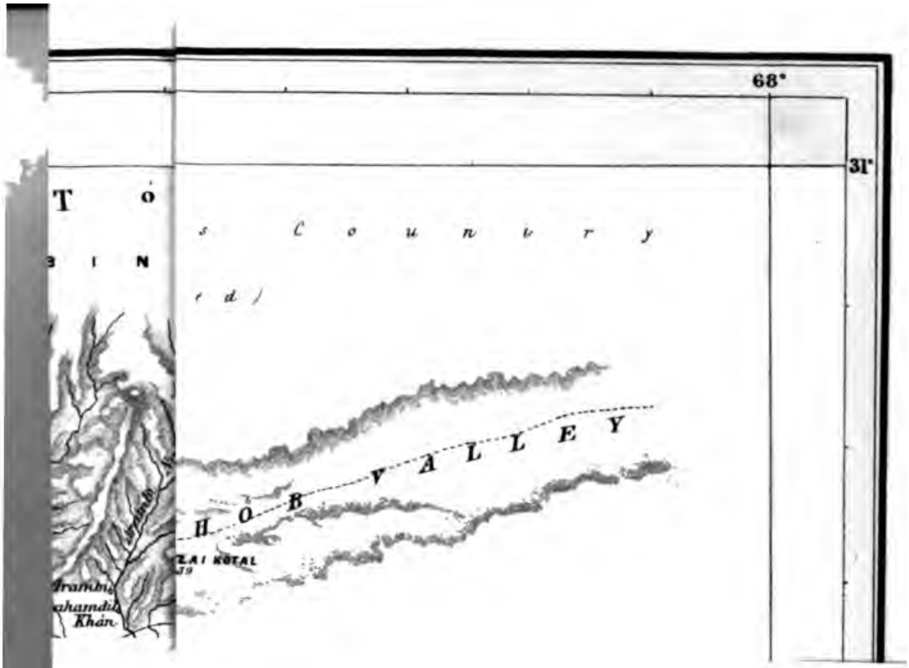
Petermann's 'Geographische Mittheilungen.'—Die Westküste Grön
zwischen Godthaab und Frederikshaab. Nach den Aufnahmen des Ma
lieutenants J. A. D. Jensen. Scale 1:1,000,000 or 13·6 geographical mil
an inch. With an inset map of Greenland. Scale 1 : 14,000,000 or 1
geographical miles to an inch, and 3 views. Petermann's 'Geographi
Mittheilungen,' Jahrgang 1880, Tafel 5. Justus Perthes, Gotha, 1880. (*Dul*

EUROPE.

Artaria & Co.—Neuester Plan von Wien mit Vororten (bis Schönbrunn). S
1 : 24,200 or 3 inches to a geographical mile. Wien, Verlag u. Eigenthum
Artaria & Co. 1879–80. Price 2s. (*Dulau.*)

Austrian Government.—Specialkarte des Königr. Ungarn. Herausgegeben v
k.k. Militär-geograf. Institut in Wien. Scale 1 : 144,000 or 2 geographical m
to an inch. Blatt H 15. L 13, 15. Price 1s. each sheet. (*Dulau.*)

Petermann, Dr. A.—Wandkarte v. Deutschland. Scale 1 : 1,000,000, or 1
geographical miles to an inch. 8th Edition. 9 sheets, coloured. Justus Pert
Gotha, 1879. Price 5s. (*Dulau.*)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PROCEEDINGS

OF THE

ROYAL GEOGRAPHICAL SOCIETY

AND MONTHLY RECORD OF GEOGRAPHY.

Voyage on the Coasts of Norway and Lapland.

By Lieutenant GEORGE T. TEMPLE, R.N.

(Read at the Evening Meeting, March 22nd, 1880.)

Map, p. 336.

THE coast of Norway is yearly visited by so many of our countrymen, and has been described by so many talented authors, that, at first sight, that part of the subject of the present paper might appear to be exhausted. This, however, is not really the case, for none of these authors have considered the hydrography of the coast, the investigation of which was my chief employment, and which is of great importance to this country. It is of scientific and commercial importance, not only for its own sake, but as the connecting link between Great Britain, the European Polar Sea, and Siberia, and a single glance at the numerous harbours in tempting proximity to the latest "scientific frontier" in Scandinavia is sufficient to show that it is also of political importance.

In June 1874, I was invited to join two friends in a yachting cruise to Norway and Lapland, on the understanding that I should take command of the vessel and contribute a certain share of the expenses. One of these friends was Mr. W. Grant, whose subsequent services in the *Pandora* and *Willem Barents* are well known. The original object of the cruise was to explore some of the Lapland rivers with a view to sport, but it eventually developed into an undertaking of a far more serious nature.

I found that the yacht which had been hired for the occasion was in no way fitted for rough work, but as it was a question of taking that one or none at all, I naturally made no objections. She was a yawl of 35 tons register, and 9 feet draught, was well supplied with carpets and crockery, but had no storm sails, and was altogether badly found. She was also very crank, and was called the *Annie*. Her crew consisted of a mate, cook or steward, and four seamen, so that we were nine all told.

The *Annie* left the Victoria Docks on the 2nd of June, touched at Lowestoft to pick up a new boat, and on June 5th the voyage may be said to have fairly commenced.

On June 9th, the wind shifted from W.S.W. to N.W., and increased to a severe gale, with a very heavy and confused sea. This lasted for three days, and tested our limited resources to the utmost, the absence of storm sails being severely felt. Green seas were taken in repeatedly, part of the bulwarks was washed away, rigging and sails damaged, and chaos would be a mild term to apply to the state of affairs between decks. At daylight on the 13th, Siggen Hill on Bömmel Island was sighted, and as we were driving towards a formidable lee shore and the *Annie* was nearly helpless in the tremendous sea, it was decided to try for the little harbour of Melingsvaag.

Here, as on most parts of the Norwegian coast, the mainland and larger islands are fronted by numerous islets and rocks, which it was impossible to identify, owing to the small scale of the Admiralty charts; and though we had the best sailing directions to be procured in England, little was to be gathered from them beyond the obvious fact that the coast was dangerous; the fine roomy channels which lead between the outer rocks to secure harbours, and which are easy enough when one knows the way, being almost ignored.

As we dashed before sea and wind towards the terrible line of breakers, I scrambled out on to the bowsprit and conned the ship, keeping a good look-out for dark patches of water. Then, slipping between two steep islets where there was just room for us, and no more, we got into smooth water and made our harbour in safety.

I have dwelt on this incident because it inspired me with a strong desire to extend our hydrographical knowledge of this coast, which lies so near to our shores, and is so much frequented by our shipping, that our seamen and merchants might reasonably expect to be furnished with reliable information concerning it.

A thorough refit being absolutely necessary, we beat through the inner channels to Bergen against a fresh gale, and on the 22nd of June the voyage was resumed under more favourable auspices. All hands were the fresher for a week in harbour, and the *Annie* was better prepared for the sort of work that was expected. We had also parted with the mate because he scorned sobriety, and did not "live laborious days."

After navigating the principal inner channels between Bergen and Hatleö, where H.M.S. *Racoon* struck on a rock in 1865, we put to sea, and proceeded outside the islands for Hammerfest. The voyage was uneventful, but some little difficulty was experienced in making the land north of the Lofoten Islands, owing to very thick fogs, and the distance to which the rocks extend seaward. While becalmed off Fuglö, we had an opportunity of sounding in the neighbourhood of some mythical shoals, which had long been a source of anxiety to seamen, but have since been correctly marked in the Admiralty charts. The season was an unusually late one, and as we beat through the south-western entrance to Hammerfest on the 6th of July, the snow was lying on sheltered slopes quite down to the water's edge, the thermometer standing at 40° in the shade. But only two days later, when passing through the fiords between Hammerfest and the North Cape, we saw little snow, and the temperature had risen to 54°.

A succession of calms enabled us to make a careful study of the tides between Hammerfest and the North Cape, besides visiting a noted "loomery," and reconnoitring the harbours and entrances from seaward, which are often used by White Sea traders and others. I may here observe that the tides on the west and north coasts of Norway strikingly resemble those of Orkney and Shetland in their various motions and irregularities, and the whirls and eddies in the Pentland Firth are at least equal to those in the once famous Malström, or more properly, Moskenström. The velocity of spring tides is greatest in the former channel, while the Malström can boast of a more dangerous sea in bad weather. The tides on the west coast of Norway appear to be produced by a tidal wave which comes from the south-west and swells along the coast to the north-east, making high water at Hammerfest three or four hours later than at Skudesnæs; and it is a peculiar fact that the rise of tide increases steadily to the northward. Between the Naze and Jæderen the rise and fall is almost imperceptible; at Bergen springs rise four to five feet, and at Hammerfest and the North Cape, upwards of nine feet.

On the 14th of July we passed through a fleet of more than a hundred Russian fishing boats off the entrance to Varanger Fiord. The occupants appeared to regard us with peculiar disfavour, but we could no more understand the reason why than we could translate the adjectives they so freely applied to us; their gestures, however, were very intelligible, and we half expected to be boarded. A few hours later we anchored at the head of the Peisen Fiord, after a sharp struggle with a tearing "white squall" from the north, which ignominiously routed our dirty friends the fishermen, and nearly cost us a topmast.

The Peisen or Petshenga Fiord is the first noticeable inlet to the eastward of Jacob's River, which terminates the boundary between Norway and Russian Lapland, and its past history justifies the assumption that it is destined to become a place of some importance if the Russians decide on establishing a commercial or naval station near the frontier. In the middle of the sixteenth century, the monk Trifan—"the apostle of the Lapps"—built a church at the mouth of the Petshenga River, which flows into the fiord of the same name, and in 1556 he obtained the endowment of the whole neighbouring district, the monks having to pay a yearly tribute to the crown of Norway. Trifan's reputation for sanctity soon attracted a crowd of followers, and when the monastery was plundered by a marauding party of Swedes in 1590, about 200 colonists, including 56 monks, were killed. It is evident, therefore, that the colony must have been in a flourishing condition, and that the monks had made the best use of their opportunities. They owned considerable herds of cattle, exported the produce of their lands and fisheries in vessels of their own building, and for many years completely monopolised the trade of a large part of Lapland. At the present time, the rich woods and pastures of the Petshenga Valley and adjacent districts are almost deserted, the entire population consisting of about 300 Lapps, who live chiefly by hunting, fishing, and the produce of their reindeer. The Peisen Fiord possesses at least one good harbour which is never frozen.*

During our stay in the Peisen Fiord my two companions went on shore one day at low water, and on their return found that the boat was surrounded by the tide. One of the men who had landed with them waded out to bring her on shore, but got out of his depth, and would certainly have been drowned if Mr. Grant had not gone after him, and supported him to the boat. As the water was extremely cold, and there was no other boat within many miles, I think Mr. Grant's exploit did him great credit.

Nine miles north of the Peisen Fiord are two small islands, which are often spoken of in old documents as a sealing station.† At present they are uninhabited, except by sea-birds. The largest island is barely two miles long, about one mile broad, and the highest point is 50 feet above the sea. It is covered with a deep layer of mould, which must be of extraordinary richness, as it is simply an accumulation of guano, deposited in the course of ages by countless millions of sea-birds. The higher parts of the island are overgrown with luxuriant grasses, and thickets of angelica about six feet high, the low swampy places with sedges and osiers. In the middle of the island is a little tarn, which, during the breeding season, is literally alive with sea-birds. Two of the slopes facing seaward consist of deep, dry, black mould, scantily covered with short grass. These slopes are so riddled with holes scraped by the puffins, that when walking over them the foot constantly sinks into the ground. There is no doubt that these islands might become important egg and down preserves, but at present the birds are not protected, and their numbers have consequently decreased.

After visiting the harbours and fishing stations between Peisen Fiord and Jacob's River, we went to Vadsö to complete provisions and stores, and then coasted along Ribatshi Peninsula, or Fisher Island, anchoring in Karabella Bay, where there is a summer trading station, on the 25th of July. With the exception of some half-dozen Norwegian families, this great peninsula, which with the "Middle Peninsula" has, roughly speaking, an area of 350 geographical square miles, is quite uninhabited, though the coast is visited by migratory fishermen, and the interior by a few nomadic Lapps with their reindeer, every summer. In some respects, however, it offers greater advantages to settlers than the coast districts of Finmarken; for the pastures are rich, and there are flourishing birch woods on the isthmuses which connect the two peninsulas with each other and the mainland. Considering the situation, the size of the trees is astonishing, especially on slopes with a southern aspect, where they attain a height of 20 to 25 feet, while some of the stems are from seven to fourteen inches in diameter.

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* Called by the Norwegians *Normansæt* (from "Normansæder"—the Normans' seats), and by the Russians *Mala niemetskaia Guba*—the Little German (i. e. Norman) Bight or Bay.

† They are called *Ainak* by the Lapps, *Ainova* by the Russians, and *Henö* or *Hanö* by the Norwegians.

During the next six weeks we visited some of the principal fiords in the north-western part of Russian Lapland, and spent some time on the well-known Pasvig River, besides making excursions inland. I shall only mention one or two points in connection with this part of the cruise, as the notes I made on Russian Lapland have been put together in some detail in a separate paper, which will appear in a subsequent number of the 'Proceedings.'

There are certain features common to all the inlets between the inner part of Varanger Fiord, and the east side of Kola Fiord, where the character of the country changes, and the "tundra" begins. Where exposed to sea-winds, the dreary-looking granite cliffs show hardly a trace of vegetation; then the birch appears, with grasses and heather; and a few miles further in, the hills are clothed with verdure to the water's edge. There are no glaciers, no lofty jagged peaks, but only unsightly patches of snow, and rounded summits of moderate elevation. The traces of former glaciation are universal, and "erratics" are very common. Many of these blocks are of great size, and when seen from beneath show out very distinctly against the sky-line; they often appear to be so nicely poised that a breath of wind might suffice to disturb their equilibrium, and send them thundering down the slopes.

One or more rivers flow into the head of every fiord, and banks of alluvial deposit, on which there is good summer anchorage, extend a considerable distance from their mouths. Many of these banks are dry at low water, and they are generally so steep that a quick use of the lead is necessary when approaching them. We several times anchored in five fathoms, and almost immediately touched the edge of the bank; and at the mouth of the Titov River the depth decreases from seven to two fathoms within the length of a small ship, or about 25 yards. At the mouth of the Litsa, ordinary springs rise 14 feet, so we were able to careen the yacht, and thoroughly clean her copper, which was much required.

It is evident that travellers are scarce in this region, for in Ora Fiord, where there is a thriving little colony of Quæns or Finlanders, an old Lapp sold us three grilse, weighing 17½ lbs., for thirty-six Norwegian skillings, or 1*s*. 4*d*. of English money. We then gave him a glass of rum, which he so highly approved of that he insisted on giving us four sea trout, weighing 14 lbs., altogether 31½ lbs. weight of beautiful fish for 1*s*. 4*d*. and a glass of grog. The Quæns, however, are keenly alive to their own interests.

There is also great similarity between the rivers, which are generally broad, but not deep, and frequently widen out into lakes. They are tidal up to the first unnavigable rapid, which is seldom more than two or three miles from the embouchure, though sometimes boats can ascend much further. The banks are low and well wooded, first with birch, varied here and there by solitary firs, the remnants of extensive woods that have probably been destroyed by fire. A few miles inland the banks become higher, the stream stronger, and the firs more numerous; the aspen also appears, with mountain ash, and wild currant. The lakes are studded with islets, which are covered with underwood and rich grass, and in many places settlers would have little difficulty in clearing ground enough for grazing. The Quæns in Ora Fiord raise turnips successfully, and probably potatoes and carrots would thrive also. The natural resources of the country are, however, quite undeveloped, and, apart from the scattered villages, a few wretched turf huts, used by the Lapps during the salmon season, are the only traces of human handiwork.

There is yet another feature which is so very common to all the inland districts of Lapland and Northern Norway that it may not be ignored. This is the extraordinary prevalence of mosquitos, whose sting—to quote Dr. Webster—"is peculiarly painful and vexatious." Birch-bark oil is I devoutly believe the only thing for which these pestilent little insects have any real respect, though tobacco smoke will to a certain extent keep them at bay. What they live on when they have driven the reindeer to the hills, and travellers to the sea, is a question which I do not pretend to answer, but I know where some of them go to when they die, for when sailing along the coast one day we noticed that the sea was thickly strewn with them for a distance of several miles, and this, as we calculated with vengeful glee, must have reduced the swarms on shore by many thousand millions. It has been suggested that the abundance of mosquitos in these latitudes may be attributed to the absence of swallows, but this is altogether a mistake. The common swift (*Cypselus apus*) is common up to latitude 64° N., the chimney swallow (*Hirundo rustica*) up to the Artic circle, and the house and sand martins (*H. urbica* and *riparia*) over the whole of the Scandinavian Peninsula.

The political geography of the north-western part of Russian Lapland is of special interest and importance. After exactly 500 years of litigation, the frontier question between Norway, Sweden, and Russia was finally arranged by a convention held in 1826, and the "common district," so called because Norwegian and Russian subjects claimed equal rights to the use of it, and which extended from the eastern shore of Bugö Fiord to the middle of Fisher Island, was then divided so that Norway only retained about one-third of the disputed coast-line, while Russia took the lion's share of the interior also. In 1825 the population of the entire "common district" was only 149, but since then the portion allotted to Norway has been greatly improved; roads have been made, regular steamer communication established, and the various wants of the colonists well provided for. It now forms a separate parish, called Syd-Varanger, and in 1865 had 1171 inhabitants, while the Russian part, with at least equal natural advantages, is still comparatively desolate and unused. The contrast is, indeed, too striking to escape notice. Under Norwegian rule we find content, security, and a hearty welcome to many a snug and cheerful homestead. In the fiords of Russian Lapland the deathly stillness is only broken by the startling scream of a frightened sea-bird, and hardly a trace of human habitation relieves the oppressive sense of utter loneliness.

In the fiords we visited, the shores are generally steep, and the dangers easily detected; and, as the late Sir Francis Beaufort observed in 1854, the Admiraly charts "appear to give a very correct and satisfactory representation of the coast of Lapland, and of the shores of the White Sea." Further examination would, however, be necessary, should the Russian Government encourage colonisation on a more extensive scale than at present.

We returned to Vadsö on the 10th of September, and anchored in the sound between Vardö and the mainland on the morning of the 12th, nine days after the arrival of the members of the Austro-Hungarian Arctic Expedition. We found that this place was incorrectly laid down on the Admiralty chart; and, as I pointed out in the October number of the 'Proceedings' (page 669), all the sailing directions hitherto published are quite wrong with regard to the anchorage. Vardö is not only an important fishing and trading station, but would be a more convenient depôt for traders to the Ob and Yenisei than any other port in Norway.

Bad weather detained us at Vardö for a week, and as my companions wished to get back to England, and the rapidly approaching winter rendered it doubtful how long the *Annie* would be on the way, they transferred themselves and their baggage to a southward bound steamer. Altogether the return voyage to Hammerfest was rather dreary; the season of perpetual daylight was long past, the nights were very dark, and the great loomeries were so completely deserted, that of all their teeming millions not a single bird was to be seen.

parations were soon made for the rough work before us, and by th of September—on which day we found ice on the decks in the ng for the first time—all was ready for a start. We did not y leave Hammerfest, however, till the 12th of November, for gh we went out several times we were very glad to be able to get for repairs. The way in which the sea gets up on the coast of way, even in the inner passages, and the terrific squalls that sweep n from the mountains, would astonish anyone experiencing their cts for the first time, and our foretaste of what we were likely to et with during the winter had a very bad effect on the crew. I erefore discharged three of them, and procured two men from the crew a stranded collier—the worst bargain, I think, that I ever made. When we at last got away from Hammerfest my crew consisted of hree seamen and a lad who combined the duties of cook and steward, but he was of no use on deck except in fine weather, and in moments of danger would lash himself to the mast and let the fire go out.

Although the general features of the Norwegian coast are well known, it may not be out of place to give a rough sketch of it here. The whole coast, with one or two exceptions in the south, is rocky, steep, and very irregular, being deeply indented by numerous fiords or arms of the sea. On the south-west coast the character of the scenery is generally monotonous, and is comparatively low and tame; it increases in interest and variety towards the north, and between Trondhjem and Hammerfest presents a scene of savage grandeur which is perhaps only rivalled by the coast of South Greenland or the Straits of Magellan. The north coast is distinguished by table-topped, precipitous headlands about 1000 feet high, of which the North Cape is a good example, but decreases in height and boldness of outline to the eastward and southward. The west and north-west coasts are skirted by a deep range of islands, interspersed with undulating clusters of low, rounded, rocky islets, which often lie in long rows nearly parallel to the coast. Many of the larger islands rise abruptly from the sea to the same elevation as the mainland, or from 2000 to 4000 feet; the smaller ones vary in size from mere rocks to islets 100 feet high, and extend to a distance of 10 to 30 miles from the mainland. The channels between these islands and rocks form the wonderful inshore route called the "Inner Lead," which continues with few interruptions from the Naze to the North Cape, and is in many places so completely land-locked that it has been compared to a chain of lakes. Some of the passages in the Inner Lead are so narrow and intricate that they should not be attempted by square-rigged vessels except with a leading wind, but for steamers and fore-and-afters this route is generally both safer and more convenient than the open sea, while its numerous anchorages afford refuge in cases of emergency. The number of steamers running up and down the coast of Norway all the year through is now very considerable, and is steadily increasing; all these vessels take the Inner Lead. Long before we left Hammerfest I had determined to take the Inner Lead too, not only because the yacht would have had no chance in the open sea in winter, and I did not wish to lay her up, but because I was convinced that it was the only way to obtain a thorough practical knowledge of the coast, which, with the materials already existing, would, I hoped, enable me to compile reliable sailing directions for the benefit of others. This resolution was confirmed by the accounts which I heard on all sides of the dangers and difficulties of the undertaking, everyone agreeing that for a stranger it was a sheer impossibility, but, having had no previous experience of the Norwegian coast or winter, except that gained during the last few months, I thought that these accounts were somewhat exaggerated.

The beginning of our voyage augured favourably for its success; the wind was fair, and it was still light for nearly four hours in the middle of the day; but this state of things only lasted a very short time. We left Hammerfest with topmast down, and two reefs in the mainsail, a precaution amply justified by after events, for the wind is so treacherous under the high land that a vessel may be taken flat aback by a heavy squall without any warning, and the frozen ropes and sails were often as much as we could manage and something more. Tromsö was reached on the evening of the 14th, in the midst of a heavy snowstorm, the precursor of a strong south-westerly gale which lasted till the 18th. So fair a passage tended to give the men confidence, and they began to enter into the spirit of the enterprise. The bright, cheerful-looking little town seemed also like a veritable oasis in the desert of rocky precipices and snow.

We left Tromsö on the 18th of November, and passed through a good deal of small ice at the entrance to Ry Strömmen, a narrow strait and rapid where the *Annie* was whirled round like a child's toy, but escaped the rocks, and passed through safely to Malangen Fiord. Then our good fortune deserted us, and for the next three weeks we had a rough time in the most literal sense of the word.

I believe it is not generally realised in this country that, notwithstanding the vicinity of the great ice-fields, the west and north coasts of Norway, and the Murmanian coast of Lapland, are open to navigation the whole year through. Owing to the warm ocean current to which the relatively mild climate of Norway is mainly due, the temperature of the sea is almost invariably above freezing point at the surface, even in winter, while the deep water always shows degrees of heat. The outer harbours are, therefore, never closed by ice, neither is floating ice met with at sea, except in small masses, which drift out of the inner recesses of the fiords, and are soon dispersed. That which we saw had evidently drifted out of Bals Fiord, a deep inlet to the southward of Tromsö.

The Ry Ström, which connects Malangen Fiord with the southern entrance to Tromsö, is generally considered a dangerous passage, even for steamers, on account of its numerous whirlpools and the strength of the tides, which during springs attain a velocity of more than eight knots. It has, however, a navigable channel between 400 and 500 yards broad, and there are anchorages at both ends where vessels may wait for a convenient opportunity to pass through. On the whole, Malangen Fiord is the best of the many entrances to Tromsö from the south and west, and as such is a channel of some importance. It has lately been partially resurveyed, the new charts being on a scale of 1 : 50,000.

Here I wish to draw attention to a matter of very great importance. On account of the distance to which the dangers extend off shore, and the general tendency of the current to set a vessel towards them, it is hardly possible to be too cautious when approaching the coast of Norway during the foggy weather which is prevalent in summer, and soundings would therefore be of inestimable advantage to navigators. For many generations past, traditions have been handed down amongst the fishermen concerning a great bank called the "Havbro," or "Sea-bridge," and it is now known that the Scandinavian Peninsula does not rise abruptly from great depths, but rests on a vast rocky foundation, or platform, which extends to a distance of 120 miles from some parts of the coast of Norway, and forms a great submarine causeway that bridges over the space between Europe and Spitzbergen. Within the outer edge of this platform, the depth of the sea is further diminished by a great chain of banks, which indirectly affect the climate by preventing the intermixture of Arctic water with that of the warm current. But for this platform, with its overlying banks, the excess of the sea temperature over that of the air would probably be much less than it actually is; the snow plane would rest upon large tracts of country which it touches in places even now, refrigerating the climate to an indefinite extent; and the great fisheries which contribute so largely to the prosperity of the Norwegian nation would have no existence. Unfortunately our knowledge of the depth, extent, and position of these banks is still extremely meagre. Between Trondhjem and Lofoten it is supposed that the Havbro lies at a distance of 30 to 50 miles from the outer rocks, and has an average breadth of 10 to 15 miles, with a minimum depth of 60 to 80 fathoms; on the coast of Lofoten and Vesteraalen it approaches the outer islets to within 10 miles, and rises so near the surface in places that the sea breaks, or at least tops, on the highest points; while still further north it runs in close to the outer shoals of Utvær, a cluster of islets and rocks near the entrance to Malangen Fiord. Owing to its distance from land, and the stormy character of the sea, the Havbro is but little known to the fishermen, and the information derived from them is very unsatisfactory. It was, however, considered worthy of attention, and after a strict scrutiny of all the evidence, a portion of the bank was charted in accordance with it.

The following particulars with regard to this portion may be accepted as fairly reliable. The Havbro is about six miles distant from the outer dangers off the entrance to Malangen Fiord, but much nearer to those off Utvær, and is therefore separated from the outer coast-line by a channel which varies in breadth, and is generally more than 100 fathoms deep. The breadth of the bank may be estimated at from eight to sixteen miles. According to the unanimous testimony of the bank fishermen, it is "flat as a table," and has an average depth of thirty-five fathoms. It consists of sand and pulverised coral, and is generally covered with *Echini* and their shells. There are, however, clean white patches, or rather depressions in the surface of the bank, which the fishermen positively assert are caused by fresh-water springs, and in these places the fish specially congregate. It appears, then, that if a vessel approaching this part of the coast in thick weather should strike soundings in thirty to forty fathoms, and then deepen the water on an easterly course, she could not be far from the outer dangers, and might possibly be close to Utvær. This is sufficient to show that a thorough examination of the banks along the whole coast is a great desideratum, even from a purely practical point of view, and the beautiful survey which is now in progress cannot be considered complete until seamen are able to use the lead when making the land.

The last morning of November found the *Annie* running under her foresail alone through one of the most difficult bits on the coast, going about six knots before a very big sea. The anchor was let go in Tiel Sund at eleven o'clock, and the rattling of the chain through the hawse-pipe was sweetest music to our ears, for we had several times been within an ace of hopeless shipwreck. The poor little yacht was covered with ice and snow; her mainsail was disabled by the snapping of the frozen topping-lifts; her boat was smashed; and her crew were worn out by twenty hours of bitter work in thick snow and blinding spray, which froze as it fell. Our clothes were frozen stiff; all had more or less severe frost-bites; and two of us had been badly bruised by the boom, my right arm being nearly disabled. I was also nearly blind from long and anxious watching, and incessantly straining to make out some definite object amidst the dreary waste of snow. However, we set to work at each other's feet with a will, melted a kettle-full of snow for coffee, the water on board having long since become solid ice, and were soon in high good humour with ourselves and all the world besides.

To make a long story short, we arrived at Bodö on the 11th of December, after a tremendous thrashing in the Vest Fiord. The distance from Hammerfest to Bodö is only 320 miles, and as we had been hard at work for a month, our daily average was barely 11 miles, although we had had a fair passage to Tromsö.

For some time past the saloon and cabins had presented a very peculiar appearance, for as the cooking stove was the only one on board, the vapour in the after part of the ship had covered everything with [illegible] thick rime like hoar-frost; this used to sparkle and look beautiful by candlelight, but occasionally it would thaw a little and run down the bulkheads, soaking into the beds and cushions, so that they were generally frozen as hard as boards. We all felt the want of suitable clothing, but suffered most from having no foot-covering beyond ordinary stockings and sea-boots. Sometimes, after steering continuously for many hours, I could not walk, or even stand, without holding on to something.

I had to part with my English crew at Bodö, for they had become [illegible] source of constant and painful anxiety, not that I had any serious difficulty with them myself, but they quarrelled amongst themselves, and seemed to have quite lost their vigour and nerve. I think the weird scenery had much to do with this, for when the great, fantastically shaped masses of rock have put on their winter garments, they present a ghostly appearance in the dim light which inspires an unutterable sense of loneliness and desolation. As Bodö is the headquarters of the great Lofoten fisheries, which give employment to upwards of 20,000 men, I had no difficulty in getting a picked crew of bachelors. One married man was most anxious to join us, but his wife objected so strongly that we had to give up the idea of taking anyone who had so much to lose.

Having procured some warm clothes and an extra stove, I had several trial trips with the new crew while learning their language, went the round of the Lofoten fishing stations, and paid another visit to Hammerfest, so that when we left Bodö for the last time on the 7th of May, 1875, the season was so far advanced that we had fewer difficulties to contend with when working southward. It is, therefore, unnecessary to follow the *Annie* step by step down the coast, and I shall only draw attention to one or two of the numerous places we visited.

The first of these is the great glacier-bearing range of Fondalen on the coast of Nordland, which has not yet been surveyed, and would be a most interesting field of observation. A distinguished Norwegian surveyor, Captain De Seue, told me that he believed its area would prove to be almost equal to that of the celebrated Justedalsbræ. I also heard, though I did not see them, that more than one of its glaciers are actually washed by the sea, and another "calves" into a lake in the interior. In other respects the great province of Nordland is one of the most interesting districts in Norway, and it is, perhaps, the least known.

It will be remembered that in 1878 the steamer *Louise* was stranded on her way to the Yenisei in a narrow and dangerous strait called Brönösund, well known to travellers on account of its vicinity to the curious natural tunnel through Torghatten. This affords a striking example of the disasters arising from deficient hydrographical knowledge. Here, as on many other parts of the coast, there are several nearly parallel channels, and the pilots, if left to themselves, will generally take the one frequented by coasters, though, as in this case, it may be the most dangerous of all. Had the *Louise* kept a little to the westward, she would have found a clear, open passage, and safety would have been insured at the trifling cost of half an hour's extra steaming. With the exception of the northern entrance to Ekersund, which is only 60 feet wide by measurement with a lead line, Brönö-sund was the narrowest channel through which the *Annie* passed; the northern part is about 30 yards broad, the tide runs through it like a sluice, and the dangers could only be shown on a large scale plan.

After many adventures, and some perils, we at last rounded the southern extreme of Norway, and returned to England in September, having navigated the whole coast from Lapland to Christiansand without the assistance of a single pilot. That the voyage was so far successful was of course partly due to the precautions taken to make it so, but I have no wish to underrate the singular good fortune to which alone we owed our safety on more than one occasion. Several times during the winter a gleam of moonlight breaking through a rift in the clouds, gave us a momentary glimpse of wicked looking rocks, and enabled us not only to avoid the danger, but also to estimate the strength of the currents. In some places again we had to trust almost entirely to what I can only call an instinct of locality, which such a cruise is sure to develop; and twice we must have passed so close to sunken rocks on a part of the Trondhjem coast that has not yet been properly surveyed, that I do not know to this day how we escaped them.

The navigation of the Norwegian coast is undoubtedly difficult, and requires great caution and promptitude; but although the islands which protect the coast also render it difficult of access, yet there are nearly always deep channels between them capable of admitting the largest vessels. During the summer months navigation is of course facilitated by the length of the days, especially within the limits of perpetual daylight; but in winter, when the nights are proportionately long, the weather stormy and cloudy, and the landmarks often obscured by snowstorms, or rendered nearly undistinguishable by their uniform covering of snow, it is extremely hazardous and dangerous. Even at this season, however, in the intervals of fine weather, the moon and stars sometimes render all objects distinctly visible, and the aurora borealis occasionally affords sufficient light to read by. When navigating the Inner Lead under sail, everything should be kept ready for shortening sail at a moment's notice, on account of the suddenness and violence of the squalls, and the baffling nature of the wind under high land. In winter, when the ropes and sails are often frozen, and the decks slippery with ice, it is safer to carry reduced canvas always, as it is difficult to shorten sail smartly under such circumstances. We used to look upon the snow as our worst enemy, however, for the storms are often so heavy that the land is completely obscured for hours together, though perhaps quite close to the ship.

With regard to the Admiralty charts, I reported to the authorities that those for the coast between the Naze and the Romsdals Islands are practically of little use, the scale being so small that many dangers and places described in the sailing directions cannot be shown. The Norwegian charts, which are on a scale of 1 : 100,000, and 1 : 50,000, are very good, and may be bought at all the larger towns in Norway; but it would be necessary for English seamen to master the Norwegian abbreviations, conventional signs, &c., before they could use them. From latitude 63° to 64° 10′ N., there is unfortunately a gap which the Norwegian surveyors are doing their best to fill up, but owing to the shortness of the season during which they are able to work some time must elapse before the survey is completed, and in the meantime the old charts for this part of the coast must be used with caution. From latitude 64° 10′ to the Russian frontier, the charts are sufficiently correct for practical purposes, though they are not reliable as to minor details, and some of them would be improved by carrying the fiords further inland.

The detailed results of the cruise of the *Annie*, and of my second voyage up and down the coast of Norway by steamer in 1876, are, however, embodied in a volume of sailing directions which I compiled under the direction of the hydrographer to the Admiralty. The work was an exceptionally difficult one of its kind, owing to the extreme intricacy of the coast, and the nature of the materials at my disposal; but I can honestly say that I have spared no pains to make it as complete as possible. The manuscript was finished last June, and I was recently informed that it is "passing through the regular course requisite for publication."

The Norwegian crew returned to their own country by steamer, and I was most sorry to part with them; they were orderly, trustworthy men, and on many trying occasions proved themselves hardy and fearless seamen, worthy of their descent from our common ancestors the vikings. They were also not a little proud of their ship and their flag, which I flew at the masthead as a compliment to them and the laws under which they sailed, and so the colours of "Old England" and "Old Norway" floated amicably together, and we literally sailed "under two flags."

In concluding this sketch of our cruise, it is only fair to the little *Annie* to say that though her faults were neither few nor trifling, yet she carried us safely through many dangers, and will be long remembered in Norway as the first vessel, either native or foreign, that ever came through the Inner Lead without a pilot.

The following discussion took place :—

Admiral Sir E. OMMANNEY said his visit to the coast of Russian Lapland was of a hostile nature, and did not afford much occasion for geographical research. He had the honour of being selected to command the White Sea squadron in the war of 1854, and therefore his object was not discovery. Hammerfest was the first part of the coast of Norway which he touched at, and having had to go inside the island of Soroë, he would caution all square-rigged vessels against taking that course. The coast of Norway was fringed by an archipelago of islands, and it was almost impossible for a square-rigged vessel to make progress among them owing to baffling winds. The coast rises so precipitously from the sea that there was no anchoring ground. Hammerfest was the most northern civilised town in Europe; it was a place of great commercial importance, the principal pursuit of the inhabitants being fishing; the population was about one thousand, and they were a friendly and hospitable race. The harbour was small and of crescent shape, with very deep water. On the opposite side of the bay was the town of Fuglnæs, where there was the best anchorage in the harbour. The neighbourhood was very remarkable for its mineral productions. An extensive fiord stretched from Hammerfest forty miles into the interior, and at the head of it was a large copper-mine, which was being very profitably worked by English capital. A ship under his orders ascended the River Kola. The town of Kola was the capital of Russian Lapland, about thirteen miles from the coast. The *Miranda*, commanded by Captain Lyons, succeeded in reaching the town in spite of the rapidity of the stream, which was running five or six knots an hour, and in spite of grounding several times. If the garrison of the town had commanded the precipitous cliffs that bordered on the river, they might have shot every man on the deck of the vessel. On reaching the town, Captain Lyons commanded the Russian governor to surrender all the military stores in the place, and, on his Excellency's declining to comply, the place was bombarded, and the capital of Russian Lapland totally destroyed. The only other part of Russian Lapland which he visited was the Ukanskoi Islands, within the promontory of Sviatoi Nos which the sailors Anglicised and called Sweetnose. He found a very good harbour inside those islands, which had never before been visited by our ships of war. It was perfectly sheltered, and there was a good supply of water to be obtained. While staying there he saw a herd of reindeer. His men landed and killed a good number, and after having cruised for three months in the White Sea without fresh provisions, the ships' companies enjoyed the meat. He noticed there a remarkable shrub, with fruit something like the strawberry, which was profusely eaten. The Russians use it as an antiscorbutic. The charts supplied by the Admiralty to our squadron for that service in the White Sea and adjacent coasts proved very accurate. They were prepared from the Swedish and Russian surveys. Although they were totally unacquainted with the navigation, the squadron were enabled to search every part of the White Sea, and conduct the blockade of Archangel in 1854 without any casualty to the ships. He wished to express his admiration for the work which Lieutenant Temple had accomplished, his endeavours to provide sailing directions for the coast being most praiseworthy.

Commander HULL congratulated the Society on having had a hydrographical night. The object of the Society was the promotion of geography, but however correct the information might be which was obtained about the land, the work could not be regarded as complete until the nature of the sea-coast was also known. Lieutenant Temple had shown that there was still a great deal to be done by hydrographers and nautical surveyors. He also wished to call attention to a body of men who did a great deal for England—yachtsmen. They might be regarded as Naval Volunteers. An instance of what they did was afforded by the paper which had just been read. The Meeting had, however, only had a short sketch of the mass of information which Lieutenant Temple had given to the Admiralty, and which would enable the Hydrographic Office to bring out new charts and a good Norway "Pilot." Not only would yachtsmen benefit by this, but also the merchants who traded from Hull. Sir Henry Rawlinson had happily remarked that hydrography was a twin-sister to geography. Hydrography might therefore be regarded as a ward under the protection of the Society, and when the lady was neglected it was the duty of that Society to call the attention of the public to the fact. This had been already done by Sir Bartle Frere, who, in a letter to Mr. Gladstone in December 1873, thus wrote:—"You will, I am sure, pardon me for taking exception to the expression in your letter, which indicates an opinion that voyages for survey or discovery are not strictly professional naval services. I believe that in these days when it is so difficult to find a seaman's training for our young officers and men, when so much of the work is done by machinery, there are few better naval schools than a surveying ship; and that if such ships were multiplied, not only would commerce benefit, but your men-of-war would be better supplied with practical seamen, both among officers and men." He was happy to say that Sir Bartle Frere was still exerting himself in the good cause. It was through his efforts that a great part of the East Coast of Africa in the neighbourhood of Zanzibar was surveyed, and he was now pressing the Colonial Office to move the Admiralty to get surveys made of the East and West Coasts of Africa northward of the Cape Colony. This was not merely a humane or scientific question, but one that seriously affected the commercial interests of the country. He therefore asked the Society to do all in its power to advance hydrography and Her Majesty's Surveying Service; which had been well described as a force "not alone useful in peace, but also terrible in war."

Commander CAMERON hoped that the fruit of Lieutenant Temple's hydrographic labours would ere long be made public. He had mentioned in his paper Mr. Grant's exploit, but he had not referred to a far more heroic act, when he (Lieutenant Temple) jumped overboard in a stormy sea to save a man's life. It should be remembered that Lieutenant Temple had had no assistance from the outside world. He had carried the enterprise through entirely on his own account.

The CHAIRMAN (Sir H. C. Rawlinson) said the Society entirely admitted the responsibility which attached to them to foster hydrography as well as geography. It had always appeared to him that they were really twin sciences, and that as geography was imperfect without hydrography, so hydrography was imperfect without geography. It was not often that they had an opportunity of receiving so much information as Lieutenant Temple had given them, but whenever the opportunity did occur he was sure that the Council of the Society would always be ready to receive hydrographical information. He took this opportunity of expressing his great admiration not only of Lieutenant Temple's professional acquirements and personal fortitude, but also of the public spirit which prompted him at his own expense to undertake so remarkable a voyage. For three years he had been working in the Norwegian seas, for no other object than the public benefit, because no one could suppose that he would stand out night after night to be frozen for the sake of amusement. In the charming sketches which he had made of the scenery, he had shown the talent of his family. It was only due to him to mention, and it would be interesting to the Meeting to know, that Lieutenant Temple was the brother of the great Indian statesman, Sir Richard Temple, who had earned a world-wide reputation, and who was now coming home, he hoped, to run a similarly successful career in Parliament.

Ascent of the River Binué in August 1879; *with Remarks on the Systems of the Shary and Binué.* By EDWARD HUTCHINSON.

(Read at the Evening Meeting, March 22nd, 1880.)

Map, p. 336.

I HAVE been asked to lay before the Society the information as to the River Binué which has been furnished to the Church Missionary Society by their agents, who ascended the river last summer in the small mission steamer the *Henry Venn*.

It is nearly three years ago that a paper was read here by Bishop Crowther, in which he gave an account of his voyage in the *Pleiad* in 1854 up to Dulti. The present voyage has added to our maps about 140 miles of the course of the river, a running survey having been taken during the whole voyage from Djen to Ribago, the results of which are now in the possession of the Society.

Before taking up the journals of the ascent, a short explanatory introduction will, I think, assist in understanding the general importance of exploration in the direction of the Upper Binué. I ask your attention, therefore, to a few remarks on the area drained by the systems of the two rivers, the Binué and the Shary.

Before we can say what this area is, we must satisfy ourselves whether the Welle discovered by Schweinfurth belongs to these systems, or, as is asserted by Mr. Stanley, becomes the Aruwimi River, which enters the Congo from the north. Dr. Junker seems to endorse this view. In his map, which has recently been published in Petermann's 'Mittheilungen,' he speaks of the watershed which he crossed in latitude 3° 17′ north as the water-parting between the Nile and the Congo.

On this subject Schweinfurth says: "Taking into consideration the geographical configuration of this part of Africa, and relying on the information obtained along the wide tract that extends from Lake Chad to Kordofan, it may be asserted that the Welle belongs to the system of the Shary. . . .The Monbuttu and the Nyam-Nyam, with an agreement that is undeviating, all represent that the Welle holds on its course to the north-west as far as they could follow it for days and days together, till it widens so vastly that the trees on its banks are not visible, and then at last there is nothing but water and sky. This representation would imply that the river issues in some inland lake. They have, moreover, their tales to tell of the inhabitants of the country on the lower part of he river, as to how they dress in white, and, like the Nubians, kneel pon the ground and say their prayers. Clearly, therefore, these sidents are Mohammedans, and the direction and the distance of their ode would seém to corroborate an impression that they must be the habitants of some southern parts of Baghirmi."

Schweinfurth adduces other testimony from the similarity of the products of the valley of the Welle to those of Western Africa in support of his view that the Welle and Shary are the same river.

Nachtigal's Bahr Kuta, and the Bahr Kuti seen by his servant, and also Barth's Kubanda, are all links connecting the Welle with the Shary. Indeed, when we remember the immense area of the Chad, the fact that it has no other important affluent, and take into account the rapid evaporation that must prevail through a large part of the year, it seems impossible to account for the existence of the lake, save upon the hypothesis that the Welle carries its waters thither. Such arguments must have influenced so eminent an authority as Keith Johnston, in assigning the Welle to the system of the Shary.

We may then proceed to consider the limits of the systems we are dealing with.

The northern and eastern limits of the area drained by these two river systems are now fairly well ascertained. The travels of Petherick, Schweinfurth, Nachtigal, and Dr. Junker have shown them to be, on the north-east, the ranges which run from the Tibesti Mountains, and on the east the ranges which run through Dar Fur to Mount Baginze and west of the Albert Nyanza, the eastern slopes of which form the gathering grounds of the Bahr el Homr, the Bahr el Gazal, and the White Nile.

The southern limits of the area we are considering are as yet unknown. They will probably be found to be ranges of hills of no great elevation, running westwards north of the Congo, and ultimately turning north and joining the range of the Cameroons Mountains. These ranges or uplands form the northern and eastern watershed of the Congo, the Ogowé, and the Cross rivers.

The watershed of the Ogowé has been crossed by the traveller De Brazza, at no great elevation, and Keith Johnston considers that the Ogowé gathers its large volume of waters from numerous tributaries, within a radius of a few hundred miles of the coast.

The Cross River has been supposed to be a branch of the Niger, but it is more probable that, like the Gaboon River, it will be found to be only a large estuary receiving a number of small tributaries from adjacent uplands.

It will thus be seen that the north-eastern and eastern limits, and possibly also the south-eastern, are mountain ranges of considerable height, and therefore play an important part as gathering grounds for rainfall, and, though we have no exact data as to rainfall, the mass of water which must fall upon them is enormous.

The size of the Welle, as indicated by Schweinfurth, in its short course from its chief heads, shows the volume falling upon its highest gathering grounds. The drainage of the western slopes of the ranges, whose eastern sides supply the tributaries of the Bahr el Gazal, must furnish a volume equal to that stream—a volume which would be sufficient to account for the difference between the contents of the Welle, as given by Schweinfurth, and those of the Shary, as given by Major Denham, and to produce that vast body of water which floods the depression called the Bodele, crossed by Nachtigal in 1878, and finds a southern outfall in the direction I shall presently allude to.

According to the testimony of Major Denham, who made his observations on the 24th of June, 1824, the width of the Shary at its mouth was about half a mile, while its stream had a velocity of something under three miles an hour. This would indicate a stream three times as strong as that of the Welle, and if the average depth of the waters as they flow into Lake Chad be reckoned at 10 feet, it would give a volume of 85,000 cubic feet a second, whereas at the very highest reckoning the volume of the Welle is not above 20,000 cubic feet.

When Barth crossed the Shary in 1852, a much larger quantity of water was being discharged along its system. He crossed the Logon, a western branch or backwater, and further to the east he crossed the main branch at Mélé. The Logon was a large and powerful river, while the main stream contained more water at Mélé than Denham found at the mouth of the Shary.

This difference in volume is accounted for by the variation in rainfall. 1851 and 1852 must have been seasons of heavy rainfall, for Barth also found a much greater depth of water in the Binué at Taepe than was found by our men last year. It is manifest, however, that the system of the River Shary accounts for the drainage of only a portion of this vast area. What outfall is there for the rainfall on the northern slopes of the ranges to the north of the Congo and the Ogowé? I think it will be seen that the exploration of the Binué throws some light on this question and tends in the direction of the existence of a lake system somewhat similar to that of the Chad.

The earliest maps of Africa suggest a large sheet of water in the southern half of the area we are considering. Felipe Pigafetta, on information furnished by Duarte Lopez, places it in two degrees north. It is somewhat remarkable that his is the only antique map of Africa which assigns to the Niger its true outlet, and although he falls into the common error of permitting two or three rivers to flow out of the same lake, yet the general features of his map are so near the truth as to suggest that the Portuguese had a fairly correct knowledge of the interior of Africa, but lacked the scientific methods of stating the information they possessed. Coming to later times, we have Piaggia, who places a great sheet of water in lat. 1° S. long. 24° E. It is true that he himself did not see the lake, but only gives the native report. There appears, however, to be no doubt that upon that meridian Piaggia has penetrated further south than any other European. Schweinfurth, moreover, speaks of him as an acute observer, and though his great lake depends on native report, it must not be forgotten that it was native information furnished to men hundreds of miles from th spot which led to the discovery of Tanganyika and the Victoria Nyanz

At the geographical council held by Mr. Stanley at Kafurro, i Karagwe, there was a prevailing opinion that far to the north-west the Mfumbiro Mountains was a great lake, to which no Arabs had ev penetrated. These Mfumbiro Mountains are well to the south and the west of the Albert Nyanza, and the direction thus indicated poin to the quarter in which Piaggia places his great lake. It is not impo sible, therefore, that there may be in the southern part of the area we a considering, a system not unlike that of Lake Chad, and that consequent no considerable portion of the drainage from the southern hill rang finds its way north.

In the paper read before the Society by Bishop Crowther, he cam to the conclusion that, judging from the volume of water found by Bart at Taepe, the sources of the Binué would be found in the ranges whic lie to the north of the Congo in an entirely different basin to that of th Welle and Shary.

With these preliminary observations, I pass to the ascent of the Binué. It may be remembered that Bishop Crowther, in his paper, referred to the plans that were on foot for extending the work of the Niger Mission towards the interior by the Binué River. In connection with these plans, a small steamer, specially adapted for the navigation of the Niger, and yet capable of making a sea voyage, was built by Messrs. Löbnitz and Goulborne, of Renfrew. She is 120 feet long, 15 feet beam, 6 feet deep, and draws 3 feet 6 inches water on an even keel, with about 60 tons of cargo on board.

She was escorted by H.M.'s gunboat *Pioneer*, and after a very rough, and at one time dangerous, passage, reached the Niger in safety in the month of February 1878. For some time the vessel was fully occupied in work on the Lower Niger, and it was not until the flood season of last year that it was possible to make any attempt to ascend the Binué Some further delay was also caused by the enforced absence throug domestic illness of the natural leader of the expedition, Bishop Crowthe but our lay agent, Mr. J. H. Ashcroft, judged it better to make a pr liminary survey than to postpone the ascent for another year. Arrang ments were accordingly made, and the full journal and narrative of t voyage furnished by Mr. Ashcroft afford materials for the following pa

All preparations being completed, the *Henry Venn* finally got u weigh at 1.30 P.M., July 8, 1879. The course of the river is well de from the confluence up to the furthest point reached by the expediti 1854. There is no occasion, therefore, to refer to Mr. Ashcroft's jo till we reach Djen or Dulti, especially as there is nothing of impor to record save the shallowness of the river in some parts.

Mr. Ashcroft visited an important town called Wukari, abo miles on the south side of the river, and he also visited the K

Hamaruwa, or Mure. This is a Fulah town, and the people are chiefly pastoral; but they use their large flocks and herds for the cultivation of the ground in a way unknown in other parts of West Africa. The king was anxious that none of the party should go on shore anywhere beyond Djen, as the Keferis were very treacherous, and eat strangers.

After waiting a day or two, the steamer started from Chomo on the 20th August, and reached Djen that afternoon. The following are extracts from the journal:—

"A great number of people here, and Manchester goods in great request in exchange for daggers, spears, water-jugs, pipe-heads, fowls, sheep, goats, and pigeons; of the last we got above three dozen, nice tame ones, with feathers right down their legs to their feet. I went on shore and saw the chief and headmen of the town, gave my presents, and got an interpreter that spoke Fulah and the Bassama language. There are here between 2000 and 3000 people, and not five per cent. with any clothing, just a small bunch of grass before and behind, and many not that.

"*Aug.* 21*st*.—Left Djen at 10.30 A.M. Stopped to cut wood after two hours steaming; found the river rather shallow just above Djen. The river banks here are about six feet high, flat level country up to the foot of the mountains, water muddy, considerable current. This was a most beautiful evening, and the mountains shone like gold and showed some very curious shapes, the sides of a few like an immense wall, quite perpendicular. Anchored at dusk.

"*Aug.* 22*nd*.—Got under weigh at 6 A.M. The banks about four to five feet above the water; water 2, 2½, and as low as 1½ fathom this morning, but the river not difficult to navigate.

"Passed the town of Qua, on the right bank; two clusters of conical huts. Then arrived at the landing-place of the town of Gamadge, on the left bank, a mile or two below Mount Gabriel, to the west, and about 300 yards from the water-side. The men came out in great force here, armed with shields and spears, and others with bow and arrows. They appeared not to be able to make us out for some time. We spoke to them by the interpreter that we had brought with us from Djen, but the poor fellow seemed afraid to say much. I gave a present to the chief, and stayed about two hours, for I wanted to show that we were friendly. They salute here by holding up the right arm and putting the left on the stomach.

"Arrived at Iangai at 10.50, a small town on the right bank, opposite the town of Ulpi, at the foot of Mount Gabriel, on its eastern side. This Iangai is a very small place, but we were told that we ought to stop here to send to Bassama; so anchored and sent our Djen interpreter, with the messengers from this place, with a present to the King of Bassama.

"*Aug.* 23*rd*.—Messengers returned from Bassama; also the king's son brought me a cow as a present from the king; also a bullock, a present from himself. The king's son seems a nice quiet sort of a person, but the men a wild fierce lot who came with him. They had no ivory, only some lion and leopards' skins, but they did not bring them in time; so we left.

"*Aug.* 24*th*.—The chief man here has not been over friendly, and to-night he called out that he would drive us back again, and if he could not we should not get far before we were forced back.

"*Aug.* 25*th*.—Seeing all the women and children being sent away, I ordered the iron plates to be put up to protect the man at the wheel, also the rifles and cartridges to be put in readiness in case of any attack, for they threatened to fire upon us if we went up the river.

"After waiting to see if anyone came from Bassama until 9.15, we got under weigh, and soon reached another town (Bakau), also on the right bank, a mile and a half from Iangai; then another called Ieka, about the same distance again, and the same side of the river. The people did not seem to like the look of the steamer; it was more than they could understand all at once—strangers and a large canoe, so much larger than anything they had seen or had any idea of, hearing the noise and seeing the paddles go round; I am not at all astonished, for they all saluted us and wanted us to stop on our way down. This part of the country is very thickly populated, and it would not take many visits to make very good friends of these people. The current very rapid just above here; river varied in width; for the distance of 500 yards it narrows to about 250 yards wide, then opens out again to 500 or 600 yards; very few trees about here, only a few monkey-bread trees. Came in view of several new ranges of mountains, at a distance of from eight miles the nearest, to twenty miles the most distant.

"*Aug.* 26*th*.—The King of Demsar [Bassama?] sent nine horsemen and messenger with a tusk of ivory to salute me, saying how very glad he was to hear of white man having come to visit his country, and sent at once to salute him; and they came to see our ship and hear what we had to say, and if we were staying here or going higher. The king's messengers stayed on the bank, dressed in very fine scarlet clothes.

"I sent the king a suitable present; and made the messengers a small present, also the interpreter. There was nothing pleased me so much as to see these men ride bareback upon their horses, with a large bunch of spears in one hand, and to vault on the horses; and some reared considerably. I can only say they were fine men and fine horses, and the Fulahs may well call them wicked Keferis for being able to hold their own and not to be cowed by men on horseback—what the Fulahs mostly depend upon.

"*Aug.* 27*th*.—Started from here at 12 noon; had been waiting for ivory promised, but none came. The current here is three to three and a half knots; the banks were covered, and water to be seen here and there among the grass, a level plain for about six miles back to the foot of the hills on the left. On the right bank, hills, distant nine to ten miles. Just above Numun, on the right, a branch of the river strikes off, and one could see up it five or six miles; I think it follows the belt of trees that we can see, and makes an island. I don't think a river comes in there, and we did see the water running out north above Townsend Island. Here we came to the first Bula village, against which the Demsu [Bassama?] people warned us.

"I have not seen any part of Africa so thickly populated as this inhabited by the Bula people. For about 25 to 30 miles they are as thick as bees. In fact, since we left Djen, the country is very thickly peopled with fine, strong, warlike, healthy, robust people, that seem to lack nothing but a few more clothes; for they possess cattle, horses, and sheep in abundance, and are everywhere ready to repel invasion, fully armed with spear and shield, or poisoned arrow ready strung, and a quiver full ready for action.

"They put their hand over their mouths, and put it quickly back again, making a shrill noise, 'bla, bla, blu, blu,' in quick succession; some saluted us by holding up the hand, but they never appeared to know what to do, we were so strange to them, coming right into the lion's den; for nothing seeks to pass these hostile Bula villages, nor do I think it possible for anything but a good-sized steamer to be able to do this, for thousands of canoes came out during the time we took to pass all these villages. Some villages had 300 or 400 of these canoes, each holding three or four men standing up, with big long paddles, and armed with spears, which they are very expert in throwing, if we may go by what we saw them do when hunting a hippopotamus one day when anchored near while lying off Choma.

"About 4 P.M. we stopped near an island, and just above the Bula villages; but the people came in great numbers, and I was afraid we should have trouble. They seemed amazed at our stopping and landing, but I am thankful to say we all got on board again safely. I spoke to the men through the Fulah interpreter, and told the headman to come for a piece of red cloth which I held over the side; but they would not come, so I threw it into the water, and they picked it up after we got some little distance away, and it had floated down with the current.

"A fine range of mountains on the left bank I called the Buxton Mountains, but they are seen to much better advantage near Yola, and are nearer the water. From here they were about nine or ten miles off. Wright Range, on the right bank, is a splendid range, extending for a long distance, with peaks and terraces from 2000 to 2500 feet, with rugged perpendicular walls of red rock.

"*Aug.* 28*th.*—Came in sight of a fine range, extending for a long distance along the right bank. Some of the peaks I should think nearly 3000 feet high, the usual height 1500 to 2000; this range extends many miles along, and in some places, near the right bank specially so, just abreast of Yola, with plenty of rock jutting out here and there, of sandstone, much worn. This is Barth's Mount Bagele in all probability. Water shallow here in crossing, only eight feet; went along the right bank. This town, Rumde Labo, is the first since leaving the Bula territory, and it is inhabited by Fulah people belonging to the King of Yola.

"The country, which has been, since just above Djen, bare of trees, is now assuming a park-like appearance, with beautiful mountainous scenery on every side, and trees here and there, just like a park at home, and the hills rising from the waterside; hitherto there has been more or less plain extending from the river to the foot of the mountains. An artist would have been pleased with the varied play of colour, of rocks, trees, and bushes, not to mention the rich vegetation, and the deep gullies and weather-worn rocks of many shades of colour, some very rugged and bold.

"Yola stands on rising ground, about three miles * from the river, and is a long, straggling place, composed of four lots of houses and compounds, i. e. each house surrounded by a piece of cultivated ground, with a fence made of plaited grass, called by the natives zenana. These Fulah people are not like those that we see in Sierra Leone, but more of the pure negro type. We anchored at 2.5 P.M. near the town of Guengay [Dönge, of Flegel?], on the left bank. I at once sent a present to the King of Yola by the chief of Guengay, and our interpreters accompanying to inform the king that we had come from the white man's country, and that I had sent to salute him and make friends.

"*Aug.* 29*th.*—Early this morning took the launch *Winifred*, and went across to the right bank to see for firewood; found only two or three trees suitable; the ground was very rugged, very large blocks of sandstone lying about, and long grass, so that it was with difficulty that we moved about to see what the place was like. I met a number of people attracted by the noise of the steam launch, and, also knowing of the presence of the white man's ship on the other side, they were all very friendly. I missed the bows and arrows, also the spears and shields that we met at every landing-place from Lukoja to here.

"*Sept.* 1*st.*—Monday; we started from Guengay at 11.50 A.M. We steamed at a moderate speed for two hours, then we stopped just above Mount Jones, at the eastern end of Mount Bagele, to cut wood. We found that just abreast of here, on the left bank, about a mile from the river, Yola formerly stood. A few miles more to the south-east of this site was once another town, and the present Yola is the third town of that name. The reason given for removing was sudden deaths of people; and what they called bad luck made them look out for another place, so they chose the present site, about eight miles further to the west.

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* One mile, according to Mr. Flegel's map.—ED.

"*Sept. 2nd.*—Started from our wooding station at 10 A.M.; soon got into shallow water, for we had to leave the right bank, where there was plenty of water, on account of being informed that there were rocks, so we kept nearly mid-stream, and once got only five feet of water, but never touched the ground, though the water was shallow for two or three miles; river about 700 yards wide, many little tufts of grass showing here and there; water still muddy; current moderately quick. We saw many suitable wooding-places, groups of dry trees in the farms, the river-banks just showing here and there, two or three feet above the water.

"The town of Fubadu, on the left bank, we passed at 11.45 A.M.; river very wide here—1100 yards—and on the right plenty of grass islands. After leaving here we got abreast of Maude Range and McIver Peak on the west end of it, all on the right bank, about 15 miles above Yola; left and right bank swampy, and water to be seen here and there for one or two miles inland, then undulating ground here and there to the foot of Maude Range. The season must be more early here, for the crops had been gathered in already. River still wide, and we got three fathoms, 100 yards from the left bank; the lowest two and a quarter fathoms; river 1000 to 1200 yards; banks showing about two feet here and there. Followed the left bank until we came to a very narrow part of the river, from 1000 to about 150 to 180 yards wide, running like a mill-sluice, and rocks near the right bank, and the water boiling and seething up for nearly half-way across. The helm did not act, and I thought once that we should have drifted down broadside upon the rocks. We had only easy steam at the time, and by the time that steam was up we had got out of danger, though we were fully twenty minutes, and made next to no progress.

"There was a town at the narrows called Rumde Gilla, and just abreast of the rocks on the left bank. The river here takes a turn to the north, and we followed the right bank for a couple of miles, then crossed, and came to a town called Dulla, the river banks only just showing here and there a flat country for a few miles on each side of the river. Then we came to a town called Abakumbo; anchored here a short time, and gave the chief a small present. There were Batta people; all were moderately well clad, most in blue calico; none of these people carry weapons. Their canoes were made out of one piece of wood, not, like canoes in the lower river, sewn together, or fastened with iron staples. The town is on the right bank, and the river 1000 to 1200 yards wide.

"*Sept. 3rd.*—Got under weigh at 6 A.M., and soon came abreast of a small town on the right bank, and a quarter of a mile from the river, on a little rising ground called Taepe, pretty nearly surrounded on three sides with bush. We soon got into shallow water, six feet, by keeping too near the right bank. Asked the name of a prominent mountain, and was told it was the Yarita, and that the Alantika was to the south, but a long way off. The people came in canoes from Taepe, through the long overflowed grass. Soon after passing this town at 7.30 A.M., we came to the confluence of the Faro and Binué. We had to keep near the right bank, snags and tufts of grass showing shallow water to the middle of the river and the left. The current ran moderately quick here from the Faro, with all the appearance of being a shallow river, and from what we could learn from the native people such was the fact. Moreover, it was said to be full of rocks in many places. I am sorry that we had not the time to fully explore it and see for ourselves. I intended to do so when passing up; but the falling water made our return so much sooner than I expected.

"The entrance to the Binué is about 200 yards wide; four and a half fathoms of water; banks overflowed for a long distance inland. We got to a bend a little over a mile, and then the river trends to the south-east. We saw several pelicans, for the first time since being in the Binué. The water at the bend five fathoms. Banks just showing here and there. Other places looking just like inland lakes. We soon got near another bend, to a very suspicious place. Water very much broken, so kept close to the left bank, and about 200 yards beyond we came to the town of Ginada, the river 150 to 200 yards wide, and ascertained from the people here that what we had just passed were rocks. Also that there were plenty of rocks higher up the river, but that we should not get to them until to-morrow, and then the rocks were very plentiful, and if we continued on long enough we should come to a place where the river flowed over mountains. I suppose they meant falls or rapids. The rulers of this place were Fulahs, but the people mixed, some of them Batta people; but all very nicely clad, and appeared very quiet, industrious people, and were very pleased with a small present we gave them. They had nothing to sell but a little farm produce. The water just at the sharp bend was five and a half fathoms, and the river not more than 100 yards wide. The town of Ginada is just at the bend, on the left bank. We kept mid-stream for some distance, and got good water, but more to the right bank most of the way. There are many bends in the river, as will be seen by the chart. The river just above and below got wider and shallower; banks showing here and there two feet. We passed an opening in the right bank; water flowing into it to the low-lying lands. The river 300 yards wide for about a quarter of a mile; then it got to its average width, viz. about 180 to 200 yards. Passed a mountain called by the natives the Yarita, about 1200 feet bove the river. Also we passed a small town on the hill-side, about 200 feet above he river. The only way to it appeared to be over rugged rocks.

"The land overflowed on both sides of the river; 4½ fathoms of water, then 5¼ nd a nasty bend, and the river not more than about 80 to 100 yards wide. We ook quite a semicircle here; deep four fathoms most of the way. The trees are only f moderate height—20 to 30 feet. Farms on the river banks here and there, but mostly bush and trees. The mountains very near, with water on the left, and the river overflowed up, with mountains on the right bank. The river takes such sharp bends that we appeared entirely shut in many times by the mountains ahead. We saw another small town on the left bank, about two miles off, on the hill-side. Current pretty strong; depth of water pretty uniform—4¼ fathoms. Another opening, and water flowing into the bush. River gets wider, to about 300 yards. Spoke to four men, who told us that we should soon get to some rocks in the middle of the river. Asked one to come on board to pilot us, but too much afraid, but promised to come in canoe. The men went ahead in their canoe, and we followed slowly after them. At 5 P.M. we passed a mountain on the left bank—which I called Crowther Mountain, and soon another, on the same bank, which I named Kirk Mountain. The river has a sharp bend from south-east to north-east; right bank, 2½ fathoms of water. Passed two small islands that I called George and Harry Islands. Just here the river is much wider, opening to nearly 400 yards. We kept right bank all the time, following the canoe (three fathoms); and now we see, right from the left bank to within one-third across the river, rocks, and in mid-stream one point only, showing current running just like a mill-sluice. I was exceedingly thankful when we had passed this very dangerous place. Our pilots left us just above here, very well pleased with the cloth that I gave them, and I was also pleased with their service and help at so cheap a rate. A mile above here we anchored for the night at 6.10 P.M.

"*Sept. 4th.*—Weighed anchor at 6 A.M. Spoke to some men in four different canoes. The men said that they are called Kilwa, and the town that we should pass on the right bank was called Baromi, but it was some distance from the water. We kept mid-stream, and then more to the right bank again. Water, mid-river, 2¼ to 2½ fathoms. River pretty wide; about 300 yards. Farms on the bank of the river, but partially under water. These men thought the river would keep its present height for about ten days. Kept near the right bank, distant about 30 yards, 3½ fathoms; 40 yards, 2¾; close to the bank, 1½. Out of the channel, river still about 300 yards wide here. Steaming very slowly. Banks just showing river; about 300 yards. Water in mid-channel, 3½, 3, 2½, and 2 fathoms. Came to a bend, had to cross to the left bank, and half a mile beyond came to a rocky part. Water broken for three-fourths of the river; and it looked so very dangerous that we had to anchor here, near the left bank. The banks were just showing here, and the water had fallen about a foot.

"We here lowered the boat, and crossed over to speak to a number of people who had congregated on the right bank, and there was a town on the hill-side, about three-quarters of a mile away, called Gurua. The people were not able to get out to the edge of the main stream, on account of the grass being overflowed about three feet; but they called for us to try higher up, and soon we found an opening in the thick grass and pulled the boat, the people coming up to their middle in water to help us, and going before to show us the best way to get to the dry ground. We got the boat as far as we could, and then it had to be carried 30 or 40 yards.

"Mr. Kirk, Flegel, and myself, then went to visit Gurua. The chief's name was Sufeu. He informed me that the rocks near which we had anchored would soon be dry, for the water was going down, and he did not think it would rise again this year: also, that when the river began to fall it fell very rapidly, and that we should see all the rocks in a few days. When asked, 'How long are you able to use canoes?' he said, 'Two or three moons only every year.' The rest of the time they go by land, and can cross the river without canoes; but that there were deep pools, with plenty of alligators, &c. I asked the name of the mountain to which I gave the name of Burdett Coutts, and was told it was the Hossere Tingling. I asked how far the Kebbi was, and they said by canoe three and a half days, by land two and a half days. The town of Dengi was at the confluence of the Binué and Kebbi.

"'What is the Binué like past the Kebbi?'—'It is only a small river.' 'How far is it until you get to where you say the Binué comes over mountains in the Gumderi country?'—'By land, fast walking, eight days, by canoe thirteen days.' 'Do you know the name of any towns on the way?'—'Yes, a few: Rebom, Duli, Dengi, and Golumbi.' But our informant had not been beyond Golumbi, three days distant from here. They said that where the Binué rises the name of the people is the Bum people. No one that we came across knew anything of the Welle or Shary, or of any great river or lake hereabouts.

"In the afternoon we took the *Winifred* and steamed about eight miles up the river to the town of Rebom [Ribago?], on the right bank, a beautiful situation, and about a mile from the Burdett Coutts Range; magnificent mountains, looking in the distance like a large palace with the centre part of the building higher than the rest. The finest scenery of the whole river was just about here. I was exceedingly sorry to have to turn back, the country being so beautiful; and the people treating us like old friends, not the least alarmed when we approached with the steamer; they were also Bornu people, speaking Fulah.

"It was getting dusk, so we very reluctantly got into the launch to run back to the *Henry Venn*, distant about eight or nine miles. We bid the people good-bye, and they wished us God speed, and hoped we would soon come again and visit them, and be able to stay.

"We soon ran down the stream, and reached the steamer between 7 and 8 P.M.

"*Sept. 5th.*—We found the water had fallen 16 inches since last night; also that where the boat went yesterday it was dry to-day. So we got a supply of grass for the animals, bought some ground corn to make bread for ourselves, for unfortunately we had no English flour, what we had being spoiled just after getting in the river; so we had country bread for about ten weeks. It was not unpleasant, only too much sand to be altogether pleasant to one's teeth; but we were all in good health, thank God, some better than they had ever been. In Africa we had found a fine dry climate, we had next to no rain all the time we were in the upper river, and no sickness whatever. I think this would be a splendid field for white missionaries, and among quite harmless people, not *armed* to the teeth like the people in the lower river; but pastoral, teachable people, these I think would be found to be, and *right in the heart of Africa incognita.*

"We heaved up anchor at 9.40 A.M., and left these very interesting people; and with the swift current we ran down in three days to Djen, which we had left on the 20th August.

"Arrived at Djen at 2.15 P.M. on the 8th Sept.

"*Sept. 9th.*—The man that we took from here as interpreter for the Bassama language I dressed up in a shirt and smoking-cap; but he sat down, and the people on the bank—for there were 300 or 400—were looking; but when we got close to the bank he came out in state, and received the well-merited applause of a great traveller. I soon went on shore with him, and delivered him in solemn council to the king and chiefs of Djen, who were very loud in their thanks for the present I gave, and also for bringing the man safe back again after being in parts that none of them had ever seen before. I told them, amidst much laughter, that *he hid himself* when he got among the Bula people, but when coming back that he showed himself very bold when he saw that the Bula canoes could not get up to us, and the man laughed himself.

"We bought a great number of spears and daggers here, also many fowls. I was the more willing to trade with these people seeing that they were mostly without clothes, so that when the *Henry Venn* left many had clothes that had none before. 'Clothes! clothes! clothes!' is the cry of the Upper Binué, tell Manchester, and many I trust will respond to the call and send a good supply if the *Henry Venn* has ever the pleasure of visiting these people again, and I trust that she may; for I know no mission work or field that to me looks more likely of success than this, or that needs more of our Christian help and support.

"These people display great taste in making pottery, mugs and pipes; also their houses are very nice and tastefully constructed inside, with all sorts of crannies to put their little belongings. We arrived off Dansufa at 12 noon. The seriken or king was waiting in a canoe, already dressed in a scarlet coat, so at his request we anchored and he came on board; his name was Sufa, so the town is called Dansufa after him. In reply to my question the Seriken Dansufa told me that Arufo or antimony mines was not too far, and if I liked he would send a messenger and inform the people that they could bring antimony, and that the white men would buy it. I agreed to this at once; and early next morning (*Sept. 17th*) the people brought a quantity of antimony, in its crude state, to sell. Still finding it coming in, I promised to stay a little longer. The king and I got to be very good friends, and was prevailed upon to go with me to the mines.

"About 7 A.M. on the 18th, the seriken came, having first put on his coat of many colours, also very many curious charms and what they call medicine, to keep away evil and to bring good luck. Then he took his quiver and bow, which he gave to his young man, or personal attendant; also his umbrella, for he could no start without that, seeing mine; then he took his spear in the other hand and away we went, some retainers leading, and some following fully armed; for the road was not altogether safe, they said. We travelled in a southerly direction, with little variation for nearly three hours. Many small towns, but most of the towns the west were inhabited by the Mitshi people, and to the east and south by mixture, near the mines, of both Mitshi and Djuku, or people of Kororofa; for Aru the nearest town to the mines, is governed by its native chiefs and king, who recognised as the owners of the soil, though in subjection to Wukari.

"I had men coming to see me from the kings and chiefs of many Mitshi tow and to say how glad they were that a white man had come to visit their count I sent messages of salutation and a small present back to each, for none of th came without bringing me something. Also, when returning, the Seriken Dansufa told me that he never in his life received so many presents as he had do now for bringing me to visit his country, and if I could have stayed a little long he did not know what he should do with them all. But he hoped I should co and visit his country again, and then he would get horses and take me to visit so very large towns, and then I should see what the country was like three or four day away to the south. The town that I went to, and which we reached soon aft 10 A.M., was called Zuddu, or Juddu. I should think it contains 1500 to 200 people, and is to the east of the mines about two miles. A number of spearme and a drummer, also the chief men of the place, when passing the women, wen down on one knee and put their hands upon their mouths, making a noise ju like the wild Bula people. When we got near the chief's place, we stopped then a number of spearmen came against us with a rush, as though they intende to run us through with spears, but it was only to show their way of saluting strangers. They took me to declare friendship to the white man over the remains of their dead king, buried under a tree in the middle of the town. I went, after being in the town a few hours, to see the mines. I found only a series of open trenches, now nearly full of water, at the Mitshi town of Arufo about half a mile to the north. After picking up a few specimens of coloured stones, I went on invitation to visit Arufo. We had not gone there because it was thought there was no desire on the part of the people of Arufo that I should either visit the mines or their town. They gave me a very kind reception in the house first, and then took me—and all the chiefs and people followed—to have a talk in the middle of the town, under a large tree. I told them my object in coming was to make friends and to do good, and asked if they would like white men to come and teach them; and here, as at the other places, or the people that represented other places whom I asked, all expressed how glad they would be to have white men to teach them and live among them. I don't know if here at Arufo it was meant that we made friends over the grave of a dead king, like it was done at Zuddu; for there, to show that it was binding and durable, the chiefs of Arufo gave me a present of two large lumps of antimony. The chiefs of Zuddu gave me nearly 3 cwt.

"*Sept. 20th.*—The head chief and three others followed me to see me safe to the ship, where I arrived about 2.30 P.M. It being too far for the chief and his people to return home before dusk, I allowed them to stay on board all night. They attended prayers, and left early next morning, very pleased with their stay on board. Taken altogether, I think them a very interesting people, and I promised that I would pay them another visit next year, if I was permitted; also, that I would take them a few tools suitable for working the stone and breaking it up to get the antimony. The tools they had were of the most primitive description. I showed them a steel chisel of ours, also a hammer. They were very much astonished at both, but especially with what ease our steel chisel cut their soft iron. I should propose to take a few steel crowbars and steel picks, like what are used in mines; also a few steel wedges and hammers. But what would be of the greatest service would be a pump to get out the water—a chain pump, or something of that kind—

for they have no way of getting out the water, only waiting patiently for it to dry up. The work was all stopped now, on account of the water. The chiefs would gladly pay for these necessary tools; but if we could give them a start, it would confer a favour that I think would be fully appreciated, and show them very conclusively that we wanted to do them good. In running down from this point we passed most of the towns under water; water 12 to 14 feet higher than when we passed before, thus showing that this is the period of the highest rise. On the 27th Sept. the steamer reached Lukoja, all the party safe and well."

Two points deserve our attention.

First, we remark the great difference in the volume of the river as given by Barth, and as found by Mr. Ashcroft. But this may be due to a comparatively smaller rainfall on the gathering grounds which feed the river. If the conjecture to which I am about to refer is well founded, those gathering grounds are the same as supply the Wello, and a deficiency in rainfall would have affected the Bahr el Homr and Bahr el Gazal and the Nile. Now it is singular that from some cause or other the Nile between Lado and Khartum was blocked last summer, so that while our Binué party were compelled to turn back, our party, who are accompanying the messengers from King Mtesa of Uganda to Her Majesty the Queen, had to cross from Lado to Port Rek on the Bahr el Gazal, instead of going by steamer. If this was because of a deficient rainfall, it certainly would confirm the view I shall presently mention.

The next point to be noticed is that the Binué above the junction with the Mayo Kebbi is a *small* and unimportant stream, taking its rise to the south-east.

The Mayo Kebbi, therefore, seems to carry to the Binué its chief supply of water. But what is this river, the Mayo Kebbi? If we turn to the pages of Vogel and to Barth, we find that the southern portion of the kingdom of Baghirmi, through which the Shary passes on its way north, is a rich alluvial tract of country, like the delta of the Nile. And in the same manner the Shary is broken up into a number of canals, watercourses, and streams, all running in and out of the main stream. There are also numerous large sheets of water or morasses called ngáljams, which after the rains become vast stretches of inundation. On the whole Baghirmi is a country much in need of a good system of drainage.

The Mayo Kebbi no doubt acts the part of a drain; it seems to rise not far from Tuburi, in a large sheet of water which is separated by a flat level of not more than 20 miles from the large ngáljam of Demmo, which, according to Barth, is in direct communication with the western branch of the Shary.

Dr. Barth says he was persuaded that in less than fifty years European boats would keep up a regular annual intercourse between the great basin of the Chad and the Atlantic. An almost uninterrupted communication has been opened by nature herself, for, from the mouth of the Kwára to the confluence of the River Binué with the Mayo Kebbi, there is a natural passage, navigable without further obstruction for boats of about four feet in depth, and the Mayo Kebbi itself, in its present shallow state, seems to be navigable for canoes, or flat-bottomed boats like those of the natives, which I have no doubt may during the highest state of the inundation go as far as Dáwa in the Tuburi country, where Dr. Vogel was struck by that large sheet of water, which to him seemed to be an independent central lake, but which is in reality nothing but a widening of the upper part of the Mayo Kebbi. It is very probable that from this place there may be some other shallow watercourse proceeding to join the larger ngáljam of Demmo, so that there would exist a real bifurcation between the basin of the Niger and that of the Chad. But even if this should not be the case, the breadth of the water-parting between these two basins at the utmost cannot exceed 20 miles, consisting of an entirely level flat, and probably of alluvial soil. The level of the Chad and that of the River Binué, near Géwé, where it is joined by the Mayo Kebbi, seem to be almost identical; at least according to all appearance, the Binué, at the place mentioned, is not more than 850 or 900 feet above the level of the sea.

The regular second rise in the Binué which overtook the *Henry Venn* on the 14th of September, would be explained by the draining of the waters through the Mayo Kebbi, caused by the highest rise in the Chad, which occurs in August. This, taken with the vast volume of water which the rivers pour down, flooding the land for miles, seems to show its connection with a great system.

Important results to the continent of Africa might follow an effort carefully made to rectify the apparent irregularities of the Shary. If only a portion of the enormous volume of water which is now absorbed and evaporated in the vast expanse of Lake Chad were turned into the Binué, through the Mayo Kebbi, not only would such steamers as the *Henry Venn* have access to that great lake, but they could probably ascend the Shary and Welle almost up to the territories of Munza, King of the Monbuttu. I would venture to suggest to the Council an examination of the country lying between the Mayo Kebbi and the Shary, and the determination of the connection between the Shary and the Welle as an enterprise in African exploration well worthy their attention.

The following discussion ensued:—

Dr. R. J. MANN said Mr. Hutchinson had placed in his hands a series of meteorological observations taken by Mr. Flegel during the voyage. They consisted of a long series of figures, and he had been asked to examine them and to state their general purport. He found upon careful examination that the observations appeared to have been taken with considerable accuracy, and to be reliable as far as they went. They consisted of records taken four times a day: at 6 A.M.; 9 A.M.; 3 P.M.; and 6 P.M. There were no night records of any kind, so that the information all related to diurnal conditions. The observations consisted of records made by a ship's barometer, an instrument reading hundredths of an inch, and by an aneroid barometer recording in millimetres. It was not, however, of importance to say much concerning the aneroid, because the observations taken by the ship's barometer were in every sense the most interesting and reliable. The barometer registered, on leaving the junction of the Niger with the Binué on July 9th, 29·69, and on the 4th September, at the highest point of the river reached, it registered 29·05, giving a difference of reading for the lowest and the highest points of the voyage 0·64, or a little more than six-tenths of an inch. If the atmospheric pressure had been the same at the junction of the river and at the highest point on the two days of the observation, this would have given an ascent of 600 feet, but he need not say that all observations of this kind by a running barometer intended to give heights must be taken as very coarse approximations to the truth, because in the first place even the daily variations of a barometer at any one spot, from the vicissitudes of pressure, amounted to one inch of the mercurial column, which corresponded to a variation of elevation of 1000 feet; therefore, any diversity taking place to the extent of one inch in the barometer would involve an error in excess of the actual elevation given by the readings. In this state of matters there was only one thing that could be done to ascertain to what extent the indications which the observations gave seemed to be of any value. It was possible to take the whole series of the observations from the beginning to the end, from the lowest to the highest point, to collate them hour by hour, and day by day, and to see whether they rose or fell continuously with the progress of the observer. If they did that, and there was not much variation from steady progress, it admitted of the fair inference that there was some approach towards steadiness of atmosphere during the time the observations were made. He had gone through the observations upon this ground, and found very fair evidence of a tolerably steady atmosphere during that time. On July 9th the barometer read 29·69. That was the highest reading at the place of the confluence of the two rivers. On July 14th the reading was 29·51; July 18th, 29·42; July 28th, 29·32; and on August 15th, 29·22; so that there was a continuous descent of the barometer during the whole time. And upon checking this with a series of days, taking ten days and twenty days at intervals, he found that there was no instance in which the barometer recurred to the first reading of the series in consequence of atmospheric vicissitude. Therefore, from those two facts there was fair justification for the belief that the error did not amount to more than two-tenths of an inch. That was confirmed in another series of figures which he had gone through very carefully. There were four occasions when the vessel was at anchor continually for three days. He had examined the readings of each of those periods and found the variation for the three days did not amount to two-tenths of an inch upon any occasion. That certainly confirmed the other observations. A third point which might be relied upon to a certain extent was, that after the period of eighty days during which the voyage lasted, and when the vessel returned to the confluence from which it had started, the barometer read within two-tenths of an inch of the reading it had previously given at starting. Taking all these results, it might fairly be said that the error did not amount to more than an elevation of 200 feet at the outside. Assuming that the temperature was 79°, which would be about the average temperature, the result would be an indication of 624 feet for the ascent which the vessel had made. The highest reading during the entire series of eighty days was 29·69, and the lowest 29·05; consequently the extreme range of the barometer was 06·4 of an inch. The result of this as a whole would be that the fall of the river from the highest point reached to the confluence would have amounted upon the average to 15 inches per mile. That was the rate of the fall, assuming that this elevation of the barometer might be taken as an approximately correct evidence of the difference of heights. The variation of temperature recorded during the voyage, as might be expected in the position in which it was taken—that is to say, a long range extending between 7½° and 10° of north lat.—was comparatively small. The highest reading taken was 91° Fahr., and the lowest 74°, giving an extreme range of 16° for the eighty days. But it must be remembered that these were all diurnal temperatures; no reading was taken for the night, which was somewhat to be regretted, because the mere use of the self-recording minimum thermometer would at once have given that. The daily range, taken at an average, amounted to only 3° between the highest and lowest for each day—very much what might be expected on an equinoctial river where the causes of variation were probably very slight. On one day only the temperature rose to 91°, on four days to 90°, on fifteen to 88°, on eighteen to 85°, and on seven to 80°. It sank below 80° on fifty-four days, but only reached 75° on nine days. The readings of the wet and dry-bulb thermometers were taken with some constancy throughout the period, and on examining these it appeared there were five occasions on which the difference between the dry and wet bulb amounted to between 6° and 9° of temperature, corresponding to a difference of moisture of only two or three grains of water to a cubic foot. The difference in the wet and dry bulb was generally only between 2° and 4°, which would give a mean of 85° to 95° of humidity. The records made in the latter part of the dry and wet-bulb observations were very puzzling, because during the last month and a half the readings were taken when the wet bulb was dry instead of being wet. The cotton of the instrument had become choked with impurities which prevented the capillary attraction of water, and fresh cotton should have been put on before the observations were taken. The result was, all observations that were close could not be depended on, and observations which seemed to indicate a very great moisture would not be worth anything on account of this error. During the whole period rain was recorded as having occurred on twenty-eight days, and lightning occurred on twenty-one days, which was very much what might be expected under the circumstances.

Mr. R. N. Cust remarked that for the steamer, which had done all this good work, they were indebted very much to the fostering care of the gentleman who had read the paper. Every vessel had what was called a ship's husband, and the *Henry Venn* had had a most attached and attentive husband. He had supplied her with everything, sent her out, and watched over her with the greatest care. No gentleman knew more of the country between the Senegal and the Niger than Mr. Hutchinson. He had alluded to Bishop Crowther, whom many present might remember giving them, in that hall, a report on his last journey. For nearly forty years the good negro bishop had been connected with this work; he had taken part in many previous explorations, and would have gone on this occasion in the *Henry Venn*, if he had not been prevented by serious illness in his family. It might be indeed said with truth with regard to the Bishop—"Hic Niger est." He hoped that the Society would be induced, on the next occasion of a steamer going up the Binué, to send some scientific gentleman with Bishop Crowther. The eastern side of Africa had rather taken the wind out of the sails of the west, which for the last ten years had ceased to be as attractive, and he hoped that now in justice they would do something for it. The exploration of the Binué was really a desideratum, and they ought to carry it out to the end. He thought that they might employ native explorers for the purpose. The system had succeeded very well in India, and intelligent Africans for the purpose could be got through Bishop Crowther. If Africa was to be opened up, it must be by negro explorers, trained to a sufficient knowledge of what was wanted, and sent into the interior, to find their way by Lake Chad and up the Shary.

Mr. Trelawny Saunders said he did not think a greater reproach could be cast upon the enterprise of the present day than that which had fallen from the lips of the last speaker, when he stated that the country which was opened up by Denham, by Clapperton, by Laird, and he did not know how many more Englishmen who accompanied them, must be abandoned now, if its exploration was to be pursued any further, to Bishop Crowther and the blacks. The paper which had been read ought to make us proud of the Church Missionary Society, which was doing so much in Africa, when the enterprise of our merchants seemed to have failed us altogether. He hoped that the information regarding the demand for clothing, given by Mr. Hutchinson, would be repeated in Manchester, and wherever there were enterprising young men desirous of making a name in the world, and that those young men would not leave to the African negro, however highly developed he might be, the work that our forefathers used to do themselves.

The CHAIRMAN (Sir Rutherford Alcock) said they had listened to a great deal that evening of exceeding interest and of some importance, both in a civilising and in a commercial point of view. He did not entirely agree with Mr. Saunders that it was a reproach to say that they would be willing to invoke the aid of those who, with less scientific attainments than themselves, and certainly not with more courage or more willingness to devote themselves to any great object, yet had been given, by the accident of their birth and their acclimatisation, a power to resist climate which certainly was not possessed by Europeans. The number of deaths that had occurred within the last two or three years of devoted Europeans who had been penetrating both as missionaries and as scientific geographers into the interior of Africa, would lead them to welcome with cordiality any assistance that they could obtain from the native race. With reference to Bishop Crowther, he had seldom been in contact with a man more intelligent, earnest, or apparently more devoted to the work to which his life was dedicated, and any acknowledgment which the Geographical Society could make of their appreciation of the worth of his labours, and of the spirit in which they had been performed, would not be wanting. Indeed, that very day the Council had had it in consideration whether they might not be enabled to mark in some tangible manner their appreciation of his services. He did not see why they should not profit by the services of such men. In India, where the jealousy of the Chinese and Central Asian races made a more effective barrier to exploration than mountains or rivers, they had gained very largely by the aid of intelligent natives, and why should not they also gain by the help of Africans who could defy a climate to which Europeans succumbed? European lives were valuable, and, like the soldiers that they sent to eastern climates, who often fell victims, they were very costly instruments. The native African would certainly be much less costly, and, being native produce, was always on the spot. Mr. Hutchinson's paper had shown them what perfect facility of access there was to the great region watered by the Niger, the inhabitants of which are perfectly ready to receive their Manchester goods, always provided they are manufactured honestly of cotton, and not of adulterating ingredients, which would neither wash nor wear. Mr. Hutchinson had done good service in directing their attention to this new field.

Progress of the Society's East African Expedition: Journey along the Western Side of Lake Tanganyika. By J. Thomson.

Ujiji, 12*th January*, 1880.

Having formed the project of visiting the Lukuga Creek, in our land journey from the south end of Tanganyika, my first care was to find a suitable place near the lake where I might leave encamped the majority of the porters, whilst I pushed on, with a few only, as rapidly as circumstances would permit, to see the Lukuga and get back before the heavy rains set in. A locality called Liendwé, on the banks of the Lofu, was spoken of as a good camping place, and I therefore resolved to visit it.

It was with a feeling of relief that I found myself once more on the march, leaving on the 10th of November the unhealthy little oven of Pambete behind me.

Ascending the precipitous face of the hills which here border the lake, with the vertical wall above and the talus sloping below—the characteristic feature of the quartzite hills of Ulungu—we passed along a barren slightly undulating country, poorly inhabited, and covered with scrubby forest, reaching the Lofu in three stages.

Liendwé proved to be an enclosed valley where the Lofu forms a lake eight miles long and about three at its broadest, tapering towards the west. Around this lake there are a large number of native villages and Arab settlements. We were received very hospitably by the Arabs, and finding food very cheap, and a large supply to draw upon, I at once determined to establish the camp there, and accordingly set my men to work, which they did with a will, putting up for the lodgment of my bales one of the largest houses to be seen in the surrounding country.

Having made every arrangement that could be thought of, I left Liendwé on the 16th of November with thirty-seven men, taking the portable boat *Agnes* in expectation of meeting with unfordable streams, an act I afterwards had reason to regret. The following day we crossed the Lofu and entered Itawa, leaving Ulungu behind us.

From this point commenced a series of marches which, for difficulty and length, had not been equalled by any other part of our route from Dar-es-Salaam, and we had now seen more than our share of mountain work.

Five marches brought us to Pamlilo, the capital of Itawa (Akalunga of Cameron). We were received in a much more inhospitable manner than Cameron had been, and I had here the pleasure to meet with a little adventure, the first during the entire journey so far. Being considerably in advance of the men when I reached the town, I passed unobserved inside to seek shelter from the rain which was coming on. No sooner was my arrival known, and a caravan announced as approaching, than the greatest excitement appeared among the male population, who rushed towards the gate to see, as I thought, the caravan coming in. After waiting some time and no caravan appearing, I went back to the gate, and, to my surprise, found it barricaded and all the men armed, guarding the place and looking very fierce, while my men were standing outside in the rain. Thinking there must be some mistake, I laughed at them, and after some trouble got outside. I then sent messengers to the chief, inquiring the meaning of such a strange reception, and after much running backward and forward got matters satisfactorily arranged.

It seems that some time ago a notorious Arab, named Kanenda, had introduced himself in a friendly way into the town, and then taken possession of it, working his will. Since then no caravan has been allowed to enter without first sending due notice, which we had not done. We gave the chief a very large present in consideration of his position, but were very ill received, and with difficulty obtained a guide for the continuation of our journey.

From Pamlilo, the Lonangwa is reached in three marches. The river at this time was a comparatively small stream, flowing along a deep marshy valley through which we forced our way with difficulty. Another day's march brought us to the boundary of Itawa, which is formed by the Lonangwa; the river having its source near the lake shores, and after flowing west about 10 miles, turning south, south-east, and east, thus forming a great bend. The country of Itawa along our line of route forms a very hilly plateau, rising in altitude from 600 feet near the Lofu to 2000 or more at the Lonangwa. With the exception of the last-named stream, almost every watercourse is dried up during the dry season, and it is only at wide distances and near the lake that small rivulets occur.

It is impossible to give an adequate idea of the physical difficulties of our route. There was not a mile of level ground, but hills followed hills, all of the most precipitous nature, varied only here and there by some lower ridge. Seldom was camp reached till long after midday, though we started with the sun in the morning, and twice I had the hammer out to destroy our boat, which was proving frightful and dangerous work for the men; but each time the men themselves dissuaded me from my intention. The hills are clothed with trees of a much more luxuriant growth than anything we had met with in the sandy uplands of Ulungu. Owing, however, to the absence of streams in the dry season there are no villages.

There is a very small population, the only inhabited places being the embouchures of small streams, where there is generally a tract of rich alluvial ground. The people, comparatively speaking, are good-looking, not very dark in colour, with good features, though many incline to thick, everted lips. They are very inhospitable, and where they have come in contact with Wangwana they are extremely rude.

In some places game is plentiful; but the elephant, as in almost if no all the countries round Tanganyika, is nearly killed out.

There is no caravan route through Itawa, though at a place calle Sumbi, 10 miles north of Liendwé, there is a Mrima settlement The country presents too many difficulties to allow any ordinar caravan to pass. Cassava is the principal food of the inhabitant though sweet potatoes, matama, Indian corn, and other Africa products are grown in greater or less quantity, according to the suit ability of the ground.

The country of Marungu, which we next traversed, presents eve more difficulties, both from the nature of the ground and the inhabitants, than even Itawa. The mountains rise to a height of 7000 feet, with smooth, rounded outlines, except where they face the lake Large streams are numerous, and must make the country almost impassable during the rains. The climate on the mountains is very damp and rainy, and as there is no wood to be got the people lead a very miserable existence. There is no head-chief in Marungu. It is divided into three chieftainships, quite independent of each other and occasionally indulging in a little war. To the south is Masensa with a chief named Kapampa; further north is Songwe, with a chief of the same name; the rest of the country is occupied by a chief called Manda, whose district is Movu. Marungu also includes Kabuire, which at present is in the hands of Wanyamwesi, who have closed the Arab caravan route from Mpala to Katanga, and stopped the traffic along that line entirely. This state of matters has lasted for nearly three years.

The people are most excitable and suspicious, and being quite unaccustomed to caravans (at least on the mountains) they turned out in great force whenever we made our appearance, ordering us to go back, and using the most threatening gestures. Several times nothing could have prevented fighting but my presence in the front, which somewhat awed and surprised them, being totally ignorant of the white man. With these excited crowds we had frequently to argue for hours before we were allowed to go on or enter their villages; but in almost all cases we succeeded in making friends, when they proved to be very hospitable. They are extremely dark-coloured, especially those living on the mountains, who are also much afflicted with swellings in the throat, a disease not seen on the borders of the lake. They dress in goat-skins and bark-cloth, the latter being more generally restricted to the low grounds, where excellent cloth is made.

The whole country is dotted with villages, the smooth, rounded valleys producing food sufficient to support a large population. Marungu is separated from Mpala by the Lofuko.

This chieftainship seems to belong to no particular country, though the people appear to have more affinity to the Waguha than to the

Wamarungu. They inhabit a narrow strip of rich alluvial ground along the lake shore. If ever there has been a country called Utembwe, it can hardly be said to exist now. There is a chief called Fungo, who rules over a village called Tembwe on the point which bears that name. There have been a few villages at one time; but a notorious chief called Kambelebele has depopulated the country for miles around his village. From Tembwe northward the mountains decrease very much in altitude, and along all the streams there are broad, rich alluvial tracts, which support a large population. The people are Waguha, and being accustomed to small Wangwana caravans occasionally passing, and not troubled by wars, they are friendly and hospitable. The country, however, possesses few features worth noticing.

Early on the morning of Christmas Day, from the top of a high ridge, I had the pleasure of seeing the Lukuga, as a noble river flowing with rapid movement and whirling eddy away to the far west, unchecked by sand-bars or papyrus, and requiring no experiments with straws or other objects to ascertain the existence of a current. Crossing the river, and camping my men at a village called Manda, I took a canoe and proceeded to examine the barrier laid down in Stanley's map. Owing to the strength of the current we had to keep close to the side. At one or two places where the river narrowed the canoe-men almost lost command of the canoe, and it was only by doubling their fee that I could persuade them to go as far as the place where the barrier once existed.

At this place the river narrows to about half its breadth, and rushes through with all the force and noise of a mountain torrent, utterly impassable for canoe or boat of any description.

The barrier of mud and papyrus was swept away either two or three years ago, the waters of the lake having been rising till that time; since then there has been a fall of seven feet, according to the observations of Mr. Hore at Ujiji, who was also the first to see the Lukuga as an indisputable river. The following day (the 26th) I arrived at Kasenge, where I was most hospitably received by the missionaries of the London Missionary Society's station. A few days later I arrived at Ujiji, where I received a similar reception.

In a few hours I start on my return journey. I propose to pass down the Lukuga for three or four days, then strike straight for Liendwe. I shall then march, if circumstances permit, by way of Marema and Lake Hikwa through Uhehe till the Uranga is reached, following it down to its confluence with the Ruaha; after which I intend to follow a caravan route to Kilwa, and expect to reach the coast in less than five months.

GEOGRAPHICAL NOTES.

Professor Nordenskiöld.—In our last issue we recorded that the arrangements made for receiving Professor Nordenskiöld in a manner that would show how highly his labours are appreciated in this country were upset by a long continuance of easterly winds. While the *Fire Queen*, with a deputation from the Society on board, was lying at Spithead ready to meet the *Vega* at a moment's notice, the latter vessel was laboriously beating up to Falmouth, where she at last arrived late in the evening on the 25th of March, i.e. the day after our proposed banquet. A reception either at a dinner or a meeting of the Society was then out of the question, for the Easter holidays had commenced, and the impending general election had also increased the difficulties of such arrangements. It was therefore decided that the explorers should be entertained privately, and invited to visit us again at a more favourable time. Professor Nordenskiöld and Lieutenant Palander (commander of the *Vega*) reached Paddington towards midnight on Good Friday, and were entertained on Saturday by Mr. C. R. Markham. On Sunday, the 28th, a luncheon given in their honour at the Continental Hotel by M. O. Richter, Consul-General for Sweden and Norway, was followed by a dinner and reception given by Sir Allen Young, the company including the Swedish minister and some of our most distinguished Arctic explorers. Our President, the Earl of Northbrook, invited them to dine and sleep at Stratton, his country-seat in Hampshire, on Monday, and in the course of the evening of that day the Mayor of Winchester presented an address to Professor Nordenskiöld, congratulating him on the success of his labours in the cause of geographical science. On Tuesday morning a flying visit was paid to Winchester, the Professor being much interested in the cathedral, which has several features in common with that of Trondhjem. Returning to London after a luncheon given by Lord Baring, M.P., he proceeded to Coombe Bank, the residence of Mr. Spottiswoode, President of the Royal Society, where he spent the evening. On Wednesday, again returning to town, the explorers were entertained by Mr. Markham at luncheon, and by Count Piper, the Swedish minister, at dinner. Later in the evening a brilliant *fête* was given in their honour at the Freemasons' Tavern by the Scandinavian Club. They left England for Paris on the following day, the 1st of April. The cordiality with which the famous Swedish explorers were greeted by some of the chief representatives of British science and enterprise may be taken as an expression of the national feeling with regard to their great achievement.—The Council of the Society are debarred, by rules and precedent, from distinguishing the leader by the award of a Royal Medal, he being already a medallist of the Society, having received this distinction in 1869, in consideration of the important scientific results of his exploration of Spitzbergen in 1868 and previous years. It has been decided, however, that a preamble shall appear to the usual announcement of the award of the Royal Medals for the year, to the following effect:—"The completion of the North-East Passage, under the initiation and direction of Professor A. E. Nordenskiöld, is the greatest geographical achievement of the year; and the name of this distinguished explorer would undoubtedly have been proposed for the award of one of the Royal Medals for 1880 had he not already, in 1869, received a medal for the leading part he took in the Swedish Expeditions of 1868 and previous years.—In acknowledgment of the services to geography rendered by Professor Nordenskiöld by his recent successful voyage and his many previous explorations in the Arctic Regions, it is unanimously resolved that he receive the thanks of the Society and be elected an Honorary Corresponding Member."

Award of the Royal Medals of the Year.—The Royal Medals or Premiums entrusted to the Society by the Crown "for the encouragement and promotion of geographical science and discovery" have this year been awarded as follows:—the Founder's (King William IV.) Medal to Lieut. A. Louis Palander, in recognition of the services rendered by him to geography as commander of the *Vega* in the late Swedish Arctic Expedition, during which he safely navigated the ship along the unsurveyed shore of the Asiatic continent for nearly 3000 miles; the Patron's, or Victoria Medal, to Mr. Ernest Giles, for leading four great expeditions through the interior of Western Australia in the years 1872–6, during which 6000 miles of route were surveyed, and 20,000 square miles of new country discovered.

Public Schools Prize Medals.—The medals for geographical proficiency annually offered by the Royal Geographical Society to the leading public schools have this year been awarded as follows:—Physical Geography, Gold Medal, to David Bowie (Dulwich College); Silver Medal,* to Albert Lewis Humphries (Liverpool College): *Honourably Mentioned*, G. I. Schorstein (City of London School), S. Edkins (City of London School), P. J. Hartog (University College School), H. McMaster (Liverpool College), R. G. Reid (Dulwich College).—Political Geography, Gold Medal, Frederick James Naylor (Dulwich College); Silver Medal, Theodore Brooks (London International College): *Honourably Mentioned*, C. T. Knaus (Dulwich College), C. E. Mallet (Harrow School), W. H. D. Boyle (Eton College), A. D. Rigby (Liverpool College), M. G. Grant (Liverpool College), C. J. Casher (Brighton College). The special subject this year was Western Africa, between the Sahara, the territory of Egypt, and the 6th parallel of south latitude.—The examiners were, for Physical Geography, Commander V. L. Cameron, R.N.; for Political Geography, Admiral Sir Erasmus Ommanney, C.B., F.R.S. The examinations were held on the 15th of March.

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* This medal was awarded by the Examiner to Frank Taylor Sharpe (Liverpool College); but as he has already once (in 1879) gained the silver medal in the same subject he is disqualified from receiving it a second time.

Colonel Prejevalsky.—Various rumours have been circulating of late to the effect that Colonel Prejevalsky had met with some disaster in the deserts of Northern Tibet, and that he and his companions had either perished or returned to Si-ning, after having lost their way in the desolate mountainous region south of Sha-chau. The news appears to rest solely on the statement of one of the Colonel's Mongol guides, who returned to Sha-chau with an obviously concocted story of his having been forcibly abandoned by the Russian travellers, the truth being in all probability that he himself had become alarmed at the prospect of encountering hardships and difficulties in the desolate and lofty mountains in the north-east of Tibet, and, deserting the party, had retraced his footsteps to Sha-chau. It is of course not impossible, after this, that the Russians, deprived of a guide, should have missed their way. But more recent intelligence by way of India respecting a party of European travellers in Tibet leads us to hope that the reports of disaster are untrue. We learn, in short, that the Nipalese representative at Lhassa has reported to the Indian Government that thirteen European gentlemen had arrived at Nak-chu-ka, a place about twelve marches to the north of Lhassa, where one of them had died, the remaining twelve proceeding to a place called "Lithan" on the Tibetan borders. On receipt of the news (the report goes on to say) the Chinese envoys at Lhassa had advised the authorities to allow them to advance to Lhassa, in obedience to the order of the Emperor of China. This advice was not followed, and instructions had been sent to stop the advance of the party and persuade them to turn back. It is possible that these proceedings refer to Count Szechenyi's party and not to the Russian Expedition. In St. Petersburg no inquietude is felt regarding Prejevalsky's safety, nor is any direct news expected from him before May.

Routes from Dzungaria into Tibet.—M. Jametel, a student interpreter attached to the French Embassy at Peking, has communicated to the French Geographical Society a note on four routes from Dzungaria or the Tarim basin to Tibet, a brief description of which he has discovered in some Chinese records. These four routes are as follows. The first starts from Yarkand, turns the Ts'ung-ling (Kizyl-Yart or Western Pamir) Mountains, traverses Narin (Nari-Khorsum?), and enters Tibet. This route, M. Jametel observes, has been long known to Europeans, and Stanislaus Julien refers to it.* The Chinese make out that it is very difficult, and that travellers by it are exposed to dangerous fevers. The second route leads from Shayar, a Mahomedan town in Chinese Turkistan, situated south of Kuchar, and traverses immense marshes which make it impracticable. This is probably the route laid down by Captain Chapman from native information, and given in detail in the 'Report of the Yarkund Mission'; it follows the course of the Khotan darya, and is also laid down, but with less detail, by Klaproth on his map. The third road leads from Urumtsi, close by the eastern (western?) shores of Lob-Nor; it is however blocked completely by the Mongols. This would appear to be the usual route to Lob-Nor, following the course of the Tarim. We know from Prejevalsky that there is a road running in continuation of it across Northern Tibet to Lhassa; though the same authority states that for years it has fallen into disuse, principally in consequence of the Dungan insurrection. The fourth route leads from Khotan eastward across (part of) the Gobi Desert, and enters Karchi. M. Jametel gives a Chinese itinerary, which he has discovered, of the route from Karchi to Lhassa, with the names of the stations, at intervals of four to eight leagues. This route goes by way of Hai-tse-teu, Tchang-tso, Kwo-tchong, and Tengri, lakes all marked on the Chinese maps. To identify the direction, or approximate topography, on any recent maps is impossible in the existing state of our geographical knowledge of Northern Tibet. In particular, Karchi, the point of departure, is a place for which we seek in vain. Possibly it may be identical with Charchand or Karka, the latter mentioned by the Pundit Nain Singh and Captain Trotter, as a place of some importance in Northern Tibet, where roads from the north-west and from Peking unite and lead on to Nak-chu-ka and Lhassa. There is one station and one only in the Chinese itinerary given by M. Jametel which can be at all readily identified by the light of recent information, and that is Yang-pa-king said to be situated on a river north-west of Lhassa, from which it is distant five stages. This appears to correspond with Nain Singh's Dyang-pachen monastery, which lies in pretty nearly the same locality.

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* 'Journal Asiatique' for August, 1846, pp. 228, *et seq.*

Mr. Woolley's Visit to the Island of Tsu-shima and Korea.—Among the enclosures in a despatch from Sir Harry S. Parkes, Her Majesty's Minister in Japan, to the Foreign Office on the subject of Korea, we find a report by Mr. W. A. Woolley, of the Consular Service, of his visit to that country and the Island of Tsu-shima. Starting from Nagasaki and touching at Fukuye in the Goto group, Mr. Woolley arrived in due course at Idzu-no-hara, the capital of Tsu-shima, in a small harbour on the east coast of the island. Tsu-shima consists of two islands, separated by a narrow channel, which connects Tsu-shima Sound with the Japan Sea at a place called Obuna Koshi. Tsu-shima Sound is known by the Japanese under the name of Asafu Harbour; the entrance is about 2¼ miles broad, and the harbour itself some five or six miles across. The Island of Tsu-shima is politically divided into 2 *gun*, Kami Agata (the north island) and Shimo Agata (the south island), and these are subdivided into 10 *chô* (1 *chô* = 120 yards) and 109 villages; the total number of houses is placed at 6638, and the population at 30,331. The length of the island is about 80 miles, and its breadth not more than 9 miles. A range of hills stretches through it, the chief peaks of which are Zumeizan, Riuriyô, Yadate, Shiratake, and Mitake. The longest river is the Sagogawa in the north island, and those next in size are the Nita, Mine, and Se. Arable and paddy land are scarce, and cereals consequently but little cultivated. Mines are numerous, but Mr. Woolley did not hear of any but the copper mine being worked. Silver is found at Shiine in the south island; copper at Kusubomura; lead at Kashine and Shiine; coal at Funayehama in the north island, and at Shiraiso in Idzu-no-hara. The chief products are cuttle-fish, various kinds of seaweed, a little tea and tobacco, sugar, and paper. Owing to the proximity of Tsu-shima to Korea, all official communications with that country were, in the time of the Shôgunate, conducted through the Sô family, the lords of the island, who also held a monopoly of the trade with Korea.—Leaving the Island of Tsu-shima, Mr. Woolley passed between Sobaku Shima (378 feet above the sea) and some rocks known as Goroku Gamu, and entered the harbour of Chosan or Fusankai, about two nautical miles broad in some parts, and capable of affording an excellent anchorage. Its southern side is formed by the Island of Zetsuye, also called Maki-shima, which stretches from the entrance to within two cables' distance from the mainland. Its highest point is 1187 feet; parts of it are well wooded, but the greater portion is covered with grass. Wild horses were seen grazing on it, and it is said to abound in game, musk deer, and wild cats. The hills on the north side present a bleak and barren appearance, and are almost entirely devoid of vegetation, the sombreness of the russet-brown grass being only relieved here and there by stumps of stunted fir-trees. The Japanese settlement at Fusan is about a mile in circumference, and nearly 2½ miles distant from the Korean town. Mr. Woolley does not appear to have gone into the interior, and the remainder of his report is occupied with notes on some of the customs of the Koreans, gathered from Japanese works, and which, according to a Japanese who has lived for some time in Korea, are fairly correct.

Journeys in North-Western China.—In the spring of last year Mr. G. F. Easton, of the China Inland Mission, who is stationed at Tsin-chow, in Kansu, travelled through the western portion of the province, as far as the old city of Tao-chow, on the frontier—a place which is of some interest owing to the numbers of the Fan-tsze border tribe living in the neighbourhood. After travelling for 140 miles through a very sparsely populated region, Mr. Easton arrived at Tsin-tien-tsze, a village where the roads to Min-chow and Tao-chow separate; then going several miles to the north before again turning westward, he passed over two lofty hills, and afterwards crossed the River Tao. On the westward journey several hills were passed having a gentle slope and covered with wild grass, the valleys between which were frequently but small swamps and difficult to cross. On the road to Tao-chow new city, Mr. Easton notes that things on the road began to present a somewhat different appearance; the houses had flat mud roofs, and many of them an upper storey, but in nothing was the difference more noticeable than in the women. Members of the Fan-tsze tribe were first met with here; they are not, however, controlled directly by the Chinese, but are governed through a *tu-sze*, or chief, of their own choosing, who lives at Ch-wang-li, 10 miles to the south, on the road to Min-chow. A ride of 20 miles over a hilly country brought Mr. Easton to the old city of Tao-chow, which he found to be a small, desolate place, with a few shops devoted to the skin trade. On the return journey Mr. Easton visited Min-chow, travelling along the left bank of the River Tao, which there has a considerable body of water, and rushes furiously over numerous huge rocks and stones which crowd its bed. During the summer Mr. Easton made a longer journey in western Kansu, visiting Si-ning-fu and other cities. Leaving the main road at Tê-tao-chow, he went west to Ho-chow, and then pushed along the border country to Shun-hwa-ting, on the Yellow River. Crossing the river, he moved on to Ba-rung [?Pa-lung], and thence to Si-ning-fu, and returned to Tsin-chow by way of Lan-chow-fu. At Si-ning, where he remained six days, Mr. Easton met Count Szechenyi and his party, and he also heard of the expected arrival, viâ Ili, of Colonel Prejevalsky's expedition. Mr. Easton states in his letter, but on what authority it does not appear, that the altitude of Si-ning-fu is 8600 feet above the level of the sea, that of Tsing-hai, or Koko-Nor, 10,500 feet, and of Lan-chow about 5000 feet; also that the correct position of Si-ning is N. lat. 36° 33′ 32″, E. long. 102° 24′ 35″. He adds that the longitude is wrong in every map, and the latitude only right in one which he possesses.

New Guinea.—Port Moresby and the neighbouring coast region of New Guinea having proved unhealthy not only for Europeans but also for natives of Eastern Polynesia who act as mission teachers, the Rev. James Chalmers, of the London Missionary Society, last year made a journey of ten weeks' duration into the interior, in order to explore the country for more suitable localities. Travelling north-east past Moumili, on the west bank of the Goldie River, he came to Munikahila on the high land, and formed a permanent camp at Keninumu on one of the ridges. From this starting-point he made an excursion E.N.E. across the Munikahila Creek, which flows west and falls into the Goldie. His way lay along a splendid country, though somewhat broken, until he came to the Elkiri district, when he descended over rocks into a valley, lying at the base of a mountain, to which he gave the name of Mount Bellamy. There is a large population in this part, well supplied with all kinds of native food and sugar-cane, and abundant water not far off. In the hope of reaching the opposite coast of New Guinea, Mr. Chalmers went along Mount Bellamy, until he found that it ended abruptly, and

was distinct from the Owen Stanley Range. He was unable to cros
the main range owing to the height and inaccessibility of the mountain
the thick bush, and huge boulders. A fine stream which, as M
Chalmers afterwards found, falls into the Goldie, runs through th
valley at the base of Mount Bellamy; its waters are often lost unde
great masses of rock, sometimes appearing in pools far down, and a
others bubbling up over the boulders. Starting again from Keninumu
Mr. Chalmers visited Sogeri, a large district lying between the Elkir
spurs and a mountain, which he called Mount Nisbet, and runnin
round the latter east and west. Travelling east by north and crossin
the head of the Laloki several times, he came to the Favele distric
whence two streams, uniting a few miles to the east, flow in an easterl
direction, and Mr. Chalmers thinks they are probably the head-water
of the Kemp Welch, which empties into Hood Bay. He afterward
ascended a spur connected with the main range, and obtained a goo
view of Mereka, a large district on the Owen Stanley Range. Returnin
by Sogeri, Mr. Chalmers made his way along the valley of the Laloki
He visited two districts at the back of Mount Astrolabe, and from th
summit had obtained a splendid view of a country which he says he ha
not seen equalled in New Guinea. This tract stretches away west an
north across the Laloki to Vetura, and runs along the mountain of tha
range facing the Munikahila valley to the south and east by Moun
Bellamy, the Elkiri spurs, and Mount Nisbet; in a southerly directio
it stretches away to a high conical mountain, to which the name of Be
Cruachan has been given, and thence coastwise to Kapakapa and Roun
Hill. The whole country Mr. Chalmers describes as one mass of fin
green ridges on which are gum-trees and iron wood, while between th
ridges are fruitful and well-watered valleys. With the exception of
small stream at Kapakapa, the whole drainage of this country falls int
the Laloki. This river, in descending to the lowlands behind Po
Moresby, falls over the face of the high land between the Astrolabe an
Vetura. The top of the falls is 1340 feet above the sea-level; there is
ledge of rock some hundreds of feet down, and far underneath is th
great boiling caldron. Mr. Chalmers estimates the height of the fal
at about 900 feet. Below these the river runs west and south throug
a deep gorge for four miles, and then west in open country to Manuman
or Redscar Bay.

The Trek-Boers in Damara-land.*—When intelligence reached Ca
Town last year of the destitute condition of the Boers who had *trekk*
from the Transvaal, and were reported to have reached the north
Damara-land, after experiencing great sufferings in passing the Kalaha
Desert, a Relief Committee was formed, and the vessel *Swallow* w
despatched with supplies. After cruising along the coast for son

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* Chiefly from papers communicated by the Colonial Office.

time, the expedition failed to communicate with the Boers, and the *Swallow* returned to Cape Town. Mr. R. Haybittel, however, who had had considerable experience as a hunter and trader in the countries beyond the Orange River, remained behind at Walvisch Bay, and determined to make an energetic effort to open communications with the Boers. The results of his arduous journey are detailed in reports addressed to the Relief Committee and His Excellency Sir Bartle Frere on his arrival in Cape Town. Mr. Haybittel started from Walvisch Bay on November 4th, and on the 8th reached Omaruru, where he found some of the distressed Boers. Having made arrangements for their removal to the coast, he proceeded onwards, and eventually, by the assistance of the hunters in the country, arrived at the first Boer encampment on November 25th. Mr. Haybittel found that the various parties were spread over a distance of a day's journey along a limestone ridge, in which there were several small fountains. The place is situated just below S. lat. 18° (which is by treaty the southern boundary of the Portuguese possessions on the West Coast) and is about four days' journey north-east of a place called Six Fountains, and some twelve days from Fort Rock Point on the coast. The Boers were found to be in a destitute condition, living on game, when procurable, and on the root of a tree (*witgat*), which is roasted and ground, and used as a substitute for coffee. They were very grateful for the assistance sent them, and promised to fetch the goods from Walvisch Bay as soon as they could be sure of water and grass for their cattle (i.e. about the end of February). As regards their future, Mr. Haybittel has informed Sir Bartle Frere that nearly all of them were inclined to remain where they are, and make the best of their position, which by all accounts is by no means so hopeless as was previously supposed. The country is not ill adapted for cattle, and Mr. Haybittel anticipates that when the Boers have overcome the first difficulties of settlement, there will be no serious obstacle to their maintaining themselves in comfort. The point to which their attention has been directed as a better place for their permanent encampment, lies in Portuguese territory, between S. lat. 18° and the River Cunene, and nearer the coast than their present camp. The soil there is said to be fitted for cultivation, and beyond the river it is even fertile. There are few or no natives settled in their neighbourhood.

Italian Explorers in Africa.—Dr. P. Matteucci, who has not long returned from Abyssinia, has already, as we learn from Cora's 'Cosmos,' started on a third expedition into Africa with the object of exploring the little known State of Wadai, our present knowledge of which depends almost wholly on the information collected by Dr. Nachtigal. Dr. Matteucci is accompanied by Don Giovanni Borghese, son of Prince Borghese, at whose cost mainly the expedition has been fitted out, and Lieutenant A. Massari as scientific coadjutor. The travellers visited

Cairo in February last and were furnished with copies of the survey executed by Egyptian staff officers in Darfur, and on the part of th Khedive with letters of recommendation to the Sultan of Wadai. Th route to be taken by the expedition is viâ Suakin, Berber, and Khartum and they started from Suez on the 24th February last.—Respecting th fate of the travellers Chiarini and Cecchi, who left the kingdom c Shoa two years ago with the intention of proceeding through Kaffa the African equatorial lake region, the Italian authorities are still i some uncertainty. The last intelligence respecting them was to th effect that they had both reached the town of Kaffa in February 187 in good health, had been well received by the king, and were on th point of continuing their journey to the lakes. Since then no furthe news has been received, and considerable uneasiness prevails, owing t the hostile attitude of the Mahomedans in those parts.

CORRESPONDENCE.

The Tal-Chotiali Route from India to Pishin and Candahar.

Allison Grove, Dulwich, London, S.E.,
April 15*th*, 1880.

I observe in the 'Proceedings of the Royal Geographical Society' for last year, o pages 334 and 354 in the May and June numbers, that mention is made of th Vatakri Plain on the Tal-Chotiali route between India and Candahar in Afghanista —as being 4000 feet above the sea-level.

As I was Field Engineer with the D. G. K. Column, Tal-Chotiali Field Force, made observations all along this route, and I found that the Vatakri Plain was onl 1918 feet at the site of the new cantonment—since abandoned. Nahr-ka-kot, t the north of this site, was 2350 feet. The southern entrance of the Han Pas 3175 feet. The highest point of the Midhran Mountains I found to be 6050 fee above mean sea-level. Mount Marie, 7500 feet, and Chotiali, 2500 feet.

The overdrawn picture that has been given of the Vatakri Plain, about th scenery, water supply, &c., has unfortunately proved a snare and a delusion. Th Government of India sanctioned the lowest part of the Vatakri Plain as a site f cantoning British troops, but in less than a season 600 out of 1100 soldiers died c were invalided from scurvy, and sent back to India.

The water on examination was found to be charged with a vast amount of salin matter and other impurities, which brought on a sort of Asiatic cholera. The doctor condemned the site, and so did Colonel W. Musgrave, commanding the 15th Beng Cavalry. The surrounding hills which close in the Vatakri cantonment are totall destitute of soil, and are treeless, grassless, waterless, and without a sign of life; o certain portions of the Jandhran Range only a few stunted shrubs are occasionall to be met with which cling to the rocks.

Military officers who know the Tal-Chotiali route, agree that Vatakri is not the smallest strategical importance, and condemn it accordingly. An examinatio of the Han Pass, the Jandhran and Suliman Mountains, Murri, Vatakri, Lugar Barkhan, and Sham plains, has shown us that the most desirable position would b the occupation of the Khetran Valley (3590 feet above the sea). And if the Tal Chotiali route has to be kept open, Haji-kot or Dada-kot would be the most centra commanding, and healthy site for a cantonment; besides, from a military point of view it would be of great strategical importance, for we could befriend an industrious and agricultural race, the Khetrans, who are constantly being plundered by the Afghan and Biluch marauders who inhabit these hills. We could command the Han Pass, and use Fort Munro, on the Suliman Mountains, as a convalescent depôt for our sick soldiers. The Khetran Valley is much higher than Vatakri, more open, the soil is rich and yields magnificent crops, trees are plentiful, and the water is good and abundant. Under these circumstances it would be to our advantage to occupy it, particularly as we have been asked to do so by the mild and industrious people who inhabit these fertile tracts. We have more reason to protect the Khetrans from the Marris, Kakars, and Luni-Pathans, than any other tribe on our new frontier.

In the 'Proceedings R. G. S.' it is further stated that "the Vatakri Plain commands the passes into the country of the Marri tribe." It is true that a small difficult pass leads out of the Vatakri Plain, but the Han Pass *commands* the principal passes into the Marri country.

The Marri tribe live entirely by stealing, they are the most powerful of any of the tribes in the Tal-Chotiali vicinity, and are without exception the most villanous, base, and bloodthirsty. Murder is considered an honourable calling with them. They are terribly debased, and but little removed from savages in their notions of civilisation. It was some of these Marris, Kakars, and Luni-Pathans who murdered Major Howe Showers last month on the Tal-Chotiali route.

Your faithful servant,

GRIFFIN W. VYSE.

To the Editor of the 'Proceedings R. G. Society.'

REPORT OF THE EVENING MEETINGS, SESSION 1879–80.

Ninth Meeting, 22*nd March*, 1880.—Sir RUTHERFORD ALCOCK, K.C.B., Vice-President, in the Chair.

PRESENTATION.—*Thomas Christy, Esq.*

ELECTIONS.—*Captain Christopher Sullivan F. Fagan*, R.M.L.I.; *William George Lawes*; *Captain Charles Mills*, C.M.G.

HONORARY CORRESPONDING MEMBER.—*Professor A. E. Nordenskiöld.*

The following paper was read:—

"Ascent of the River Binué in August 1879; with Remarks on the Systems of the Shary and Binué." By Edward Hutchinson. (*Ante*, with discussion, p. 289.)

Tenth Meeting, 12*th April*, 1880.—Sir HENRY BARKLY, K.C.B., G.C.M.G., Vice-President, in the Chair.

ELECTIONS (at the Council Meeting of the 19th April).—*Alexander Hay Japp, Esq.*; *Robert Searles Lindley, Esq.*, C.E.; *Thomas McIlwraith, Esq.*; *Frederick Charles Mills, Esq.*; *Philip Parsons, Esq.*; *Charles Janvrin Robin, Esq.*; *Lieut.-Colonel George Edward L. S. Sanford*, R.E.; *James L. Watson, Esq.*

The paper of the evening was—

"On Masasi and the Rovuma District in East Africa." By Rev. Chauncey Maples, M.A., Universities' Mission.

The paper, with the discussion which followed, will be published in the June number.

PROCEEDINGS OF FOREIGN SOCIETIES.

Geographical Society of Paris.—March 19th: M. Grandidier in th Chair.—A letter was read from M. Paul Soleillet, dated N'diago, Feb. 18th, i which he announced that he was about to start that evening from Senegambia fo Algiers. Peace was reigning throughout the Sahara, and the traveller expected t reach Timbuctu without much difficulty.—M. Thoulet read a report on the work b M. Pierre Margry, Archivist in the Marine Department, entitled "Memoirs and documents illustrating the history of French enterprise abroad; discoveries and colonisa tions by the French in the western and southern parts of North America." Th three volumes which have appeared relate principally to de la Salle, the discoverer o the Ohio and Mississippi. Born at Rouen in 1643, la Salle when only twenty-three years old, proceeded to Canada. After some explorations directed towards the north, he conceived the project of reconnoitring the course of the great rivers, accounts o which had been received from the Indians. On his first journey he discovered the Ohio, and followed it as far as its junction with the Mississippi; but he was obliged to retrace his steps on account of the desertion of his followers, and he found himself for many years the object of the jealousy and hatred of the French colonists in Canada, and especially of the Jesuits, who saw in him a serious rival in the enormously profitable trade which they carried on in furs, and in the sale of spirits to the Indians. But by dint of perseverance and courage la Salle succeeded in conquering all obstacles, and after many fruitless attempts he finished by reaching the mouth of the Mississippi. Returning to France, he conceived the project of founding a colony in Louisiana and seizing the northern provinces of Mexico. Aided by the Government of Louis XIV., he took the command of an expedition, but being betrayed by the naval officer who navigated his vessel, he was unable to find the mouth of the Mississippi. He disembarked on the coast of Texas, and saw all his companions perish one by one, and then, in making another attempt to find the entrance to the river, he was himself assassinated by one of his men, on the 19th of March, 1687. The name of Cavelier de la Salle is that of a hero, and M. Margry has had the good fortune to make known the events of his life, which the envy of pitiless enemies had succeeded in keeping in obscurity.

—— April 2nd: Admiral de la Roncière le Noury, President, in the Chair. —This meeting was devoted to the reception of Professor Nordenskiöld, and was held in the Cirque d'été, in the Champs Elysées, the vast enclosure being filled with spectators, to the number of about 3000. A dais in the centre of the circus was occupied by the Council and officers of the Society, Prince Oscar of Sweden, the Swedish Minister, the Minister of Public Instruction, the guests of the evening Professor Nordenskiöld and Lieutenant Palander, and lastly, the delegates of most of the other learned societies of Paris, and of the departments. After an address from the President, Professor Nordenskiöld gave an account of his voyage and the principal results in geography and the allied sciences which he had obtained.

—— April 16th: General Meeting. Admiral de la Roncière le Noury, President, in the Chair.—The award of Medals for the year was read by M. William Huber, as follows:—Grande Médaille d'or, to Professor Nordenskiöld; Gold Medal, to Dr. Jules Crevaux, for his journeys in Guyana, the Amazons, and the rivers Iça and Japura, performed in the years 1876–1879; Gold Medal, to M. l'Abbé Desgodins, for his explorations on the frontiers of Tibet, in 1855–1879.—A paper was then read by M. Coillard, Protestant minister, on his journey in South Africa. Setting out with his wife, his unflinching companion in all the fatigues and dangers they encountered, M. Coillard proceeded first to Pretoria, then, crossing the Limpopo, he reached the country of the Bonyai; but being made prisoner he was taken to the Matebele. As soon as he had been set at liberty he returned towards the south, and arrived at Shoshong; but soon after set out again for the north, and reached Sesheke, the furthest point attained during his wanderings, where he met with Major Serpa Pinto, who had reached that place from Benguela. His return journey was to the south, through the Transvaal, Griqua Land, and Caffraria. His explorations lasted two years and four months.—The Bureau of the Society for 1880–81 was then announced as follows:—*President*, Admiral de la Roncière le Noury. *Vice-Presidents*, Colonel Laussédat; M. A. Milne-Edwards. *Scrutineers*, MM. Brault and Paquier. *Secretary*, M. Harmand. *Members of the Central Committee*, MM. Jackson, Fournier, De Ujfalvy, G. Périn and Janssen.

Geographical Society of Lyons.—February 1st.—Dr. Dutrieux, a member of the first Belgian Expedition, gave an account of his experiences in East Central Africa, and the results of his ethnological studies. He advocated the adoption of the Nile route as the best channel for introducing civilisation and commerce into Central Africa. He further urged that public attention should be particularly directed to the central region, in which are included the rivers Welle and Shary, and the great bend of the Congo. He afterwards explained a project for the canalisation of the Nile with a view to bringing the Mediterranean into communication with the Albert Nyanza, in connection with which he stated that a French *savant*, Dr. de Lamothe, was now engaged in making a reconnaissance in Egypt.

—— March 4th.—The President announced that in future the Secretary-General would furnish a statement of the chief geographical events of the month at the commencement of each meeting. In accordance with this arrangement, a summary was given of the latest information respecting the Trans-Sahara railway project, and the movements of M. Soleillet, Mr. H. M. Stanley, M. Savorgnan de Brazza, &c. M. L. Desgrands afterwards gave an account of the works of the Canal de la Vesubie (an affluent of the Var) at Nice, to which he had recently paid a visit.

Geographical Society of Berlin.—April 10th, 1880: Dr. Nachtigal, President, in the Chair.—After a few words of welcome to the members of the German African Society, who were present, the President read a letter received from St. Petersburg, giving an account of the various attempts made in the course of the year 1879 to establish regular intercourse by sea between the ports of Europe and the estuaries of the great rivers of Siberia. In 1879 seven ships attempted to reach Siberia from Europe by the North Cape, but of these only one, the steamer *Luise*, was successful. With two barges in tow, this vessel left Bremen on the 8th July, arrived in the Yenissei on the 15th September, and returned in good condition to Bremerhaven on the 30th October. The cargo consisted of petroleum, sugar, butter, and tobacco, and the return freight of about 20,000 poods of wheat which had been brought from the interior of Siberia to the mouth of the Yenissei in boats specially built for this purpose. All the other ventures were complete failures. The two Swedish vessels, the *Samuel Owen* and the *Express*, freighted by the well-known Moscow merchant, Sibiriakoff, endeavoured in vain to force a passage through the masses of ice accumulated at the entrance of the Kara Sea, and were compelled to return. Still more unfortunate were the two English steamers *Amy* and *Mizpah*, bound for the Obi and chartered by the merchant Funk, as also the Danish steamer *Neptun*, despatched on account of the same firm, and which, as well as Mr. Ketly's English steamer *Brighton*, came to grief in Baidarak Bay. A similar fate was in store for three sailing vessels which after having been built in the dockyard of Trapesinkow, at Tjumen (Government of Tobolsk), were laden with grain, tallow, and spirits, and sailed for Europe. The

Nadeshda and the *Ob* were shut in by the ice in Baidarak Bay, near the Tar River, and lost their tackle as well as part of the cargo; the *Tjumen* an steamer *Luise* (the latter had wintered in the Obi) ran on sandbanks in the of Obi and were thus prevented from continuing their voyage. These shi disasters have caused great surprise at St. Petersburg, where Professor Nordensk voyage had been hailed as the commencement of a new epoch in the Siberian The advocates of communication by sea with Siberia point out that 1879 has an exceptionally unfavourable year, and that most of the accidents were due much to the state of the ice in the Kara Sea, as to the want of charts, buoys, be &c. It is also suggested that while there must have been in that year a accumulation of ice in the Kara Sea, the sea round Novaya Zemlya just abou same time was free from ice, and we may conclude that in each year, accordi the direction of the prevailing wind, one of these two routes will be open to na tion; an opinion to some extent confirmed by the voyage of the English Ca Markham, who at the end of September, having found the Kara Sea encum with ice, sailed without obstacle round the northern extremity of Novaya Ze Unfortunately our experience does not date further back than the year 1875. possible that the year 1879 may have been exceptionally unfavourable, a immediate predecessors exceptionally favourable to Arctic exploration; and as vation alone, extended over a number of years, can prove the correctness o assumption, it is recommended that scientific observing stations be establish the northern coasts of Europe. Matotschkin Schar in Novaya Zemlya, and the of Waaigat offer themselves as meteorological stations where exact observations be made as to the direction of the wind which renders Kara Strait, or Jugor or the Matotschkin entrance, free from ice, and the results thus obtained mi communicated to approaching vessels. The letter went on to say that an exa tion of the difficult navigation of the Obi, and the discovery of a suitable harb the Gulf of Obi, were also urgently required, as the conditions of the latte much more unfavourable than those at the mouth of the Yenissei. As a of curiosity, the suggestion was alluded to that the difficulties of navigati Obi might be altogether avoided by the construction of a railway connecti Charua-jaga, a tributary of the Obi, with Khaipudirskaia Bay (60° E. lo Greenwich).—The President further announced that the expedition which p to found a station in East Central Africa, and which is composed of Capta Schöler, the zoologist Dr. Boehm, Dr. Kayser for geodesy, and the civil e M. Reichard (the latter accompanying the expedition at his own expense about to start from Berlin, and would probably establish a station at the sou end of Lake Tanganyika. H.M. the King of the Belgians had contributed purpose 40,000 fr., and the German African Society their subscriptions for th 1880, which amount to 16,000 marks.—Dr. Behm next addressed the Meeti the discovery of the sources of the Niger; and Dr. Stolze gave a description, upon his own observations, of Faristan, the cradle of the old Persian nation.

Geographical Society of Leipzig.—February 11th, 1880: Professor Z President, in the Chair.—Gerhard Rohlfs, the well-known African explore an account of his journey from Tripoli viâ Benghasi and Aujila to the h nearly unknown cluster of oases comprised under the name of Kufara, and de the hostile acts which resulted in the failure of his attempt to traverse Central to the Congo, by way of Wadai. The traveller and his companion, Dr. a skilled scientific observer, were robbed of almost everything they possess narrowly escaped with their lives. Dr. Stecker, who remains in Africa, wil out the original intention of the German African Society, by whom Rohlfs ha

Mr. Lindner then read a paper "On the physical geography and ethnology of the low country adjoining the German Ocean."

—— March 10th, 1880.—Mr. E. Debes, Secretary, in the Chair.—The annual report was read by the Chairman. The number of ordinary members is at present 489, of honorary members 11. The financial position of the Society is very satisfactory, permitting subsidies to be given to two members, to one towards the expenses of his journey through Russia, and to another who had joined the expedition organized by Sibiriakoff for the relief of Nordenskiöld, and the exploration of the Arctic Region north of Behring Strait. The retiring officers, Mr. Keil, Treasurer, and Dr. Pechuel-Loesche, Vice-Secretary, were re-elected; Dr. Kalkowsky was elected Librarian. A paper was then read "On the Whale Fishery," by Dr. Pechuel-Loesche, in which the different kinds of whales were described, their habitats, &c., and the development of the whale fisheries traced from their earliest beginnings in the year 1610 to the present time.

Imperial Geographical Society of St. Petersburg.—Meeting to celebrate the Jubilee of the Society, March 4th.—After some remarks appropriate to the occasion from the Vice-President, the Secretary read a review, prepared by Baron Osten-Sacken, of the progress of geography in Russia during the twenty-five years of the present reign. A quarter of a century ago Japan was closed to foreigners, and the interior of China was almost unknown; Turkistan had been but little traversed, and the Tien Shan region was wholly unexplored; the eastern shores of the Caspian had not been examined since the expedition of Kareline, the rich results of which had not yet been made public; and the prosecution of scientific studies in the Caucasus was impossible, owing to constant struggles with the mountaineers of that region. Since 1855 a complete change had taken place. The treaty of Simoda gave the Russians access to Japan, among the consequences of which were Gaschkevitch's Japanese Dictionary, published in 1858, and Maximovitch's botanical researches. The country of the Amur and the Island of Saghalien became the objects of minute study, with very interesting results as regards the flora of the latter. The coasts of Manchuria were also explored, and M. Schrenk's work on the physical geography of the region made the world acquainted with the peculiarities of the Sea of Japan. With regard to the Chinese Empire, the journeys of Colonel Prejevalsky, Colonel Sosnofsky, and MM. Pevtsof and Potanine had added greatly to our knowledge of various regions. Formerly M. Middendorf's was the only work on Siberia, but now the best description of it is that by M. Tchekanofsky. The levelling-survey of Siberia by MM. Scharnhorst and Kühlberg, the exploration of the Obi and the Yenisei, and Professor Nordenskiöld's voyage along the northern coast were all of great importance. The first person to penetrate into the Tien Shan was M. Semenof, now Vice-President of the Society, and his example had been followed by MM. Severtsof, Fedchenko, Mushketof, and others. Since the Khivan campaign attention had been paid to the Caspian steppes, and the exploration of the course of the Amu Daria had been undertaken. Since the pacification of the Caucasus, again, good scientific work had also been done in that region, one result of which had been the large map of the country made at Tiflis in 1868, and presented to the Society by His Majesty the Emperor.—M. Wilson, President of the Statistical Section of the Society, afterwards dealt with the progress of statistical science in Russia during the same period.

NEW BOOKS.

(By E. C. Rye, *Librarian* R.G.S.)

EUROPE.

Boisgobey, Fortune de.—Du Rhin 'au Nil. Carnet de Voyage d'un Parisi Paris (Plon): 1880, 12mo., pp. 348, illustrations. (*Williams & Norgate:* pr 3*s.* 6*d.*)

Peschel, Oscar.—Europäische Staatenkunde. Mit einem Anhang: Die ve nigten Staaten von Amerika. Mit Benutzung der hinterlassenen Manuscri Oscar Peschel's nach den Originalquellen bearbeitet von Otto Krümmel. Vol Pt. 1. Leipzig (Duncker & Humblot): 1880, 8vo., pp. 425. (*Williams & N gate:* price 9*s.*)

This commencement of another work from the apparently volumin MSS. left by the late Oscar Peschel, contains a general introduction on Eu pean physical geography, and separate treatments of the political geograph the Russian Empire, Scandinavia, Denmark, and the British Empire, with so of the more important physical features in detail.

Tissot, Victor.—Voyage au Pays des Tziganes (La Hongrie inconnue). P (Dentu): 1880, 12mo., pp. 536. (*Williams & Norgate:* price 3*s.*)

ASIA.

Devéria, G.—Histoire des Relations de la Chine avec L'Annam-Viêtnam du X au XIX^{e} Siècle, d'après des documents Chinois, traduits pour la première foi annotés. Paris (Leroux): 1880, large 8vo., pp. 102, map. (*Williams & N gate:* price 6*s.* 6*d.*)

Forms vol. xiii. of the Publications de l'École des Langues Orienta Vivantes. M. Devéria (the chief interpreter of the French Legation in Chin has made a special study of documents throwing light on the relations betw China and Cochin-China, chiefly a Chinese work by Wei-Yuan first publish in 1842, and detailing military operations under the Ming dynasty to 180 containing incidental geographical material. The author has also found Chinese map, with geographical notes, made under the Mongol dynasty, a revised and published in 1579, containing routes from China to Annam, and whi he considers will assist in completing our maps of Tong-king.

Heine, W.—Japan. Beiträge zur Kenntniss des Landes und seiner Bewohner Wort und Bild. Abtheilung i. Dresden (Urban): 1880, 8vo. (*Williams Norgate.*)

This commencement of a reissue in smaller form of General Heine's fol work with the same title, consists of 10 photographs, each with one page (some cases, two pages) of accompanying descriptive text. It is to be complet in 5 parts of the same dimensions, in which the History, Religion, Ethnolog Natural-history, and general aspect of the country will be discussed, at t price of 5*s.* each. The author travelled in Japan from 1852 to 1861, duri which he made a stay of seven months in Yeddo, for the purpose of collecti historical material. The present part is devoted to history, commencing wi Yoritomo in the 13th century, and ending with the Dutch Settlement Dezima. The treatment is naturally a mere outline of the subject.

Ujfalvy de Mezö-Kövesd, C. E. de. — Expédition scientifique française Russie, en Sibérie et dans le Turkestan. Vol. III. Les Bachkirs, les Vêpses, les antiquités Finno-Ougriennes et Altaïques, précédés des Resultats Anthr pologiques d'un Voyage en Asie Centrale. Paris (Leroux): 1880, large 8vo., pp. 170, maps, pls. (*Williams & Norgate:* price 12*s.* 6*d.*)

Apparently concludes the work, of which the atlas of illustrations was noticed *suprà*, p. 269. The chapter on the Bachkirs is illustrated by a map (from Russian sources) of the district in the Urals north-east of Orenburg chiefly inhabited by that race; and that on the "Vêpses" (or northern Tchudi) by a rough outline of the Ladoga and Onega region.

AMERICA.

Ratzel, Friedrich.—Die Vereinigten Staaten von Nord-Amerika. Vol. II. Culturgeographie unter besonderer Berücksichtigung der wirthschaftlichen Verhältnisse. München (Oldenbourg): 1880, large 8vo., pp. 762, maps, illustrations. (*Dulau:* price 1*l.*)

Contains the political, economical, and statistical portion of the work, of which vol. i., containing the physical part, was noticed in our 'Proceedings,' vol. i. p. 78. The (coloured) maps show distribution of races, density of population, &c.

Smith, Herbert H.—Brazil, the Amazons and the Coast. London (Sampson Low & Co.): no date, 8vo., pp. 644, map, illustrations. Price 1*l.* 1*s.*

This pleasing and instructive work is based upon six articles on Brazil originally published by the author in 'Scribner's Magazine.' The writer visited the Amazons in 1870 with the late Professor Hartt, and again in 1874, his attention being chiefly given to geology and natural history. After working for two years at Santarem, he was engaged for more than a year, at Professor Hartt's request, in exploring some of the northern tributaries of the Amazon, and the Tapajos, and he then made a further stay at Rio before returning to New York. Having acquired a considerable knowledge of the physical aspects of the country, he was enabled by the liberality of Messrs. Scribner to make two more journeys to Rio and the Amazons with the object of specially studying the coffee and sugar industries and social and commercial life of the Brazilians, and also of reporting on the famine district of Ceará, accompanied by an artist, Mr. Wells Champney.

Independently of the many scattered descriptive accounts of localities seldom visited, and of the physical conditions, natural productions and inhabitants of a region so full of interest as the Amazons, this work contains reviews of the geography of the lesser known tributaries, such as the Curuá, Mãecurú, and Xingú, as well as a special chapter on the various affluents of the great river, and an appendix devoted to a study of the geology and physical geography of the Amazons Valley. The material is deemed insufficient for correct appreciation; but so far as the author permits himself to be influenced by it, he inclines to a belief in an ancient inland lake or sea, possibly emptying itself westward.

The myths and folk-lore of the Amazonian Indians also receive special attention, in a provisional manner, as the author intends to make a further critical and comparative study of these subjects; and from the natural history collections to which he refers incidentally, it is evident that considerably further scientific results are to be expected.

The map (partly from unpublished sources) shows the confluence of the Tapajós, with the numerous lakes, the smaller affluents, limits of flood-plains, &c.

Wolf, Theodor.—Ein Besuch der Galápagos-Inseln. Heidelberg (Winter): 1880, 12mo., pp. 44, 2 maps, pl. (*Williams & Norgate:* price 1*s.* 6*d.*)

This little sketch forms pts. 9 & 10 of vol. i. of the "Sammlung von Vorträgen," edited by Professors Frommel and Pfaff, and published at Heidelberg. The maps show the whole of the Galapagos group, and Floreana or Charles Island (sketched by the author in 1875). There is also a view of Cormorant Point in the latter island.

ARCTIC.

Nordenskiöld.—Notice sur sa Vie et ses Voyages, par Ch. Flahault.
(Nilson): 1880, 8vo., pp. 76, map, portrait. (*Williams & Norgate:* price 2

Contains also a short account of the different voyages aiming at the dis
of the North-east Passage. The circumpolar map shows the track of the

Nordenskiöld.—Lettres de A. E. Nordenskiöld racontant la découverte du P
Nord-Est du Pole Nord, 1878–1879. Avec une préface par M. Daubrée.
(Dreyfous): 1880, 12mo., pp. 276, portrait, map. (*Dulau:* price 1s. 8d.)

GENERAL.

Civezza, Marcellino da.—Saggio di Bibliografia Geografica Storica Etnog
Sanfrancescana. Prato (Ranieri Guasti): 1879, large 8vo., pp. 698. (D
price 10s.)

Contains the titles and analysis of contents of 819 different works refe
to the cosmopolitan labours and voyages of the Franciscans, and consulte
the author in the preparation of his work 'Storia Universale delle Mi
Francescane.'

Davis, John.—The Voyages and Works of John Davis the Navigator. E
with an Introduction and Notes, by Albert Hastings Markham. London, p
for the Hakluyt Society (Richards, 37 Great Queen Street, W.C.): 1880,
pp. xcv. and 392, map, illustrations, and map in separate cover.

This forms No. LIX. of the works issued by the Hakluyt Society
contains reproductions of the accounts of all the voyages of Davis for th
covery of the North-west Passage, to the East Indies, Azores, &c., wh
commanded by himself or in which he merely took part, and written by
Morgan, Wright and others, as well as by the navigator. Various
bearing upon these voyages are also included. 'The Worldes Hydrogra
Discription,' 1595, and 'The Seamans Secrets,' 1607, by Davis, are also rep
(the latter with title page and various tables, &c., in facsimile). In additi
the illustrative notes, the editor gives a long biographical and historical
duction, with notes on the previous biographical accounts of Davis; and
bibliographical list of works on navigation during the reign of Elizabeth,
copy of the Letters Patent granted to Adrian Gilbert and others for the dis
of the North-west Passage. The northern discoveries of Davis, 1585–8
shown on a map; and Mr. C. H. Coote supplies some notes upon the se
map, A.D. 1600, the first that was engraved in England on Wright's (Mer
projection, and identified with the one described by Shakspere in 'T
Night' as "the new map with the augmentation of the Indies." The or
of this map is bound up with a very few copies of Hakluyt's 'Voyages' (
1600), from one of which (the Grenville copy) it was reproduced b
autotype process by Mr. Bernard Quaritch. The present reproduction is
the copy in the British Museum, which is apparently a superior one; a
accompanied by a list of 1209 names appearing on it, with identificatio
some of them which are not at first recognisable.

Eratosthenes.—Die geographischen Fragmente des Eratosthenes neu gesam
geordnet und besprochen von Dr. Hugo Berger. Leipzig (Teubner): 1880,
pp. 393. (*Williams & Norgate:* price 8s. 6d.)

Johnston, Keith.—A Physical, Historical, Political, and Descriptive Geogr
London (Stanford): 1880, cr. 8vo., pp. 487, maps, illustrations. Price 12s.

This work (the concluding portion of which was printed after the dea
its lamented author, and was actually written by him in Africa when o
point of starting for his last expedition) will recommend itself as a
introductory treatise, from the simple and practically intelligible way in w
the fundamental principles of geography are discussed in it. The sp

chapters on physical geography are well illustrated by coloured diagrams and woodcuts; and after a sketch of the chief physical and political features of each of the great continental divisions (accompanied by separate maps showing the first of those conditions), the salient characteristics of the countries in each are described with regard to extent, relief, rivers, climate, and landscape, people, government, products, and industries, religion, &c.

The historical sketch occupies about 80 pages, and is lucidly illustrated by a series of coloured maps on the same scale, showing the extent of knowledge of the earth's surface at various epochs, the unknown being obscured by clouds, which roll back as geographical discoveries are recorded.

Reclus, Élisée.—Nouvelle Géographie Universelle. La Terre et les Hommes. V. L'Europe Scandinave et Russe. Paris (Hachette): 1880, 4to., pp. 944, maps, illustrations. Price 1*l.* 5*s.*

The fifth volume of this great undertaking is completed by livraison 303 recently issued, being the first half of the work as originally proposed. In its publication no delay has taken place, and there is no falling off in the treatment; the present volume, discussing the Scandinavian peninsula, Denmark, and Russia, being indeed remarkable for the amount of information collected, especially as regards the last-named country.

NEW MAPS.

(By J. Coles, *Map Curator*, R.G.S.)

EUROPE.

Austrian Government.—Administrativ-Karte von Nieder-Oesterreich. Herausgegeben vom Vereine für Landeskunde. Scale 1 : 28,800 or 2·5 inches to a geographical mile. Sheets 22, Karlstift; 57, Wallsee; 84, Ybbsitz; 85, Gaming. Artaria & Co., Vienna. Price of each sheet 1*s.* (*Dulau.*)

Liebenow, W.—Specialkarte von Mittel-Europa. Scale 1 : 300,000 or 4·1 geographical miles to an inch. Blatt 51, 64, and 78. Lith. und color. Hannover, Oppermann. Price of each sheet 1*s.* (*Dulau.*)

Mackey, Rev$^{d.}$ Donald J., B.A. Cantab. — Diocesan Map of England and Wales; showing the Provisions of the Bishoprics Act (1878), also the other recommendations of the Cathedral Commissioners (1854), and the population (Census 1871). Cathedrals, Bishops' Residences, the Acreages, the number of Parishes of each Diocese (1879) and the Church Congress towns, with dates, are also marked. Compiled by the Rev$^{d.}$ Donald J. Mackey, B.A. Cantab., Canon and Precentor of St. Ninian's Cathedral, Perth, N.B. Scale 1 : 1,340,000 or 18·3 geographical miles to an inch. Published by W. & A. K. Johnston, Edinburgh and London, 1880. Price, in sheet, 1*s.* 6*d.*, on cloth, roller, and varnished, 2*s.* 6*d.*

Mathieson, —.—Mathieson's Map of the Railway Systems in England and Scotland; corrected to Jan$^{y.}$ 1st, 1880. Reduced by permission from the standard map of R. Price Williams, Esq$^{r.}$, M. Inst. C.E.; compared with the 'Railway Junction Diagrams' (by John Airey, Esq$^{r.}$) and with returns furnished by the Companies. Scale 1 : 870,000 or 11·8 geographical miles to an inch. Published by E. Stanford, London. Price 1*l.* 1*s.*

Petermann's 'Geographische Mittheilungen.'—Die Umgebung von Halle, Leipzig, Weissenfels zur Darstellung der Zusammenströmens der Bevölkerung vom platten Lande nach den grossen Städten & Industriebezirken 1864–1875. Von

Otto Delitsch. Scale 1:357,000 or 4·8 geographical miles to an inch. Petermann's 'Geographische Mittheilungen,' 1880. Tafel 6. Justus Perthes, Gotha. (*Dulau.*)

Royal Prussian Ministry for Public Works.—Karte ueber den Lauf des Rheinstroms im Königreich Preussen von Mainz bis unterhalb Bimmen, in 19 Sectionen. Nach dem Zustande des Stromes in dem Jahre 1872; Scale 1 : 20,000 or 3·6 inches to a geographical mile. Uebersichts Plan der 19 Sectionen; Scale 1 : 300,000 or 4·1 geographical miles to an inch. Herausgegeben von dem Koeniglich Preussischen Ministerium für Handel, Gewerbe und Öffentliche Arbeiten. Berlin, 1879. (*Dulau.*)

ORDNANCE SURVEY MAPS.

1-inch—General Maps.—New Series:—

England: No. 321, Denge Ness, 1*s.*

6-inch—County Maps:—

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Edinburgh *revised*, Nos. 1, 29, 34, 36, 37A, 40, 41A, 42, 43, 45, 45A, 48, 49, 49A, 50, at 2*s.*; New Sheets, Nos. 42A, 46A, 51, 52, at 2*s.*

Index Maps:—Surrey, 2 miles to an inch, 2*s.* 6*d.*; Nairn, 1 inch to a mile, 2*s.* 6*d.* (*Stanford, Agent.*)

GEOLOGICAL SURVEY MAPS.

Inch Scale:—ENGLAND: Westmoreland, No. 38, 6*s.* No. 66, Vertical Section, 3*s.* 6*d.* (*Stanford, Agent.*)

ASIA.

Chavanne, Dr. Joseph.—Central Asien. Nach den neuesten Quellen bearbeitet von Dr. Joseph Chavanne. A. Hartleben's Verlag in Wein, Pest u. Leipzig, 1880. Scale 1 : 5,000,000 or 66·6 geographical miles to an inch. (*Dulau.*)

This map includes that portion of Asia between the 28th and 51st degrees of North lat., and the 54th and 107th degrees East long., on its Northern boundary, the 60th and 101st degrees on its Southern boundary. It is a chromo-lithograph printed in seven colours, and the heights are given in metres. The scale of this map is sufficiently large to give a very good general idea of Central Asia, and indeed in a country, a great portion of which is intersected by mountain chains, all of which throw out numerous spurs, it would be impossible to give anything more, unless a much larger scale were adopted. At the present time, when so much attention is turned towards the military and scientific expeditions, either at work or being organized for work in Central Asia and Afghanistan, a map which extends from the eastern shores of the Caspian, to the sources of the great navigable streams of China, and which shows clearly the vertical formation of Central Asia, its characteristic deserts, and gravelly steppes, and at the same time exhibits the more recent territorial changes, and the political divisions of states, such as the new boundaries between Russia and China in the valley of the Ili, will doubtless be welcome both to the geographer and politician. There is, however, an error in this map that it becomes necessary to point out; it professes to give the new boundary between British India and Afghanistan, and it is marked on the map as being carried along the eastern slope of the East Suliman range; this is however inaccurate, and as a fact, up to the present date this boundary remains unfixed; it is, however, evident that much care has been taken in the preparation of this map, which shows the work of all the most recent explorers, both English and Russian, and in other respects is brought so nearly up to date as to show the new railway from Rhori to Quetta; but here again an error occurs, as the line by Dadar, which is given on the map, has been abandoned in favour of the route by Sibi and the Sawar Valley. It can scarcely be expected that a map which covers an area so vast, in which violent and sudden changes have been of frequent occurrence, and of which much still remains unexplored by the scientific geographer, should be entirely free from errors.

Indian Government Surveys.—Indian Atlas. Quarter sheet. Sheet 72 N.E.—Nagpoor [Nagpur], Seonee [Seoni], &c., Central Provinces.—Lower Provinces Revenue Survey. District Fureedpoor [Fureedpore]. Scale 1 mile to inch. Sheets 4, 11, and 12. Lower Provinces Revenue Survey. District Rajshahee [Rajshahi]. Sheets 1, 2, 3, 4, 5. Scale 1 mile to 1 inch.—North-West Provinces Revenue Survey. Preliminary Map of District Moradabad and Pargana Kashipur of District Tarai, 1871–77. Scale 4 miles to 1 inch.—Punjab Revenue Survey. Shekh Budin Sanitarium. Districts Bannu and Dera Ismail Khan. Seasons 1876–77–78. Scale 12 inches to 1 mile.—Punjab Revenue Survey, District Gurgaon. Plan of the City and Environs of Sohna. Scale 16 inches to 1 mile. Season 1874–75. On 2 sheets.—Punjab Revenue Survey, District Gurgaon. Plan of the City and Environs of Farukhnagar. Scale 16 inches to 1 mile. Season 1874–75.—Punjab Revenue Survey, District Gurgaon. Plan of the City and Environs of Rewari. Scale 16 inches to 1 mile. Season 1874–75.—Bhopal and Malwa Topographical Survey. Sheets 23, 25, 43. Parts of Gwalior, Indore, and Dewas. Scale 1 mile to 1 inch.—Central Provinces and Vizagapatam Agency Topographical Survey. Sheet 14. New Series. Parts of Jeypur [Jaipur] and Karond. Seasons 1861–62, 1866–68, 1869–70. Scale 1 mile to 1 inch.—Mysore Topographical Survey. Sheets 34, 57. Part of Tumkoor [Tumkur], Mysore, and Hassan Districts. Scale 1 mile to 1 inch. Seasons 1876–78.—Guzerat [Gujarat], 1876–77. Scale 2 inches to 1 mile. Sheet 28. Sections 1, 2, 3, 4. Parts of Kaira, Baroda, and Panch Mahals.—Rampa, District Godavari, Madras Presidency, and surrounding Country. Scale 4 miles to 1 inch. Transfer from the Atlas of India.—The two routes to Kabul, viâ Jellalabad and viâ the Kurum Valley. Taken principally from the surveys and reconnaissances by Officers of the Survey of India, 1878–79. Scale 4 miles to 1 inch. Size 52 inches by 34. Second Edition, with considerable additions.—Bombay Presidency, Central Portion, 1879. Scale 8 miles to 1 inch. Size 32 inches by 40.—Bombay Presidency, Southern Portion, 1878. Scale 8 miles to 1 inch. Size 27 inches by 32.—Map showing the Bombay, Baroda and Central India and Great Indian Peninsula Railways. June 187–. Scale 16 miles to 1 inch. On 2 sheets. Size 40 inches by 46.—Bombay: Map of the Island of Bombay, constructed from surveys made in the years 1865–71, under the superintendence of Lieutenant-Colonel G. A. Laughton, F.R.G.S., Bombay Staff Corps, and based upon Triangulations executed under the orders of Captains Nasmyth and Haig, Royal Engineers, in the years 1865, 1866. Scales, Nos. 1 to 68, 110 to 116, 165 to 169, 205 to 221, are 100 feet to 1 inch; the remainder are 40 feet to 1 inch. The complete Map, including both Scales, is on 221 sheets. Size of each 27 inches by 40. The following are additions to the sheets previously supplied and entered in the Catalogue, pages 425, 426, 427:—Sheets 4, 5, 8, 9, 14, 17, 18, 21, 22, 25, 28, 29, 30, 36, 37, 45, 46, 55 to 60, 64, 66, 67, 73, 75 to 79, 86, 89, 90, 102, 103, 107, 109, 121, 122, 123, 192, 193, 194.—Nasik Collectorate: Map of the Nasik Taluka of the Nasik Zilla. Prepared from the Revenue Survey, 1879. Scale 1 mile to 1 inch. Size 30 inches by 44. Map of the Nandgaon Taluka of the Nasik Zilla. From the Revenue Survey, 1879. Scale 1 mile to 1 inch. Size 44 inches by 39.—Panch Mahals Collectorate: Map of the Dohad Taluka, Panch Mahals District. Scale 2 miles to 1 inch. Size 17 inches by 19. Map of the Godhra Taluka, Panch Mahals District. Scale 2 miles to 1 inch. Size 19 inches by 24. Map of the Halol Taluka, Panch Mahals District. Scale 2 miles to 1 inch. Size 20 inches by 16. Map of the Jhalod Taluka, Panch Mahals District. Scale 2 miles to 1 inch. Size 15 inches by 15. Map of the Khalol Taluka, Panch Mahals District. Scale 2 miles to 1 inch. Size 15 inches by 22.—Thana Collectorate: Plan of Matheran. Lithographed at Poona, 1879. Scale 660 feet to 1 inch. Size 27 inches by 40.—Bombay, Southern Division. Ahmednagar Collectorate: Plan of Ahmednagar City. Surveyed in season 1877–78. Scale 66 feet to 1 inch. Size 31 inches by 46.—Poona Collectorate: Plan of the City and Cantonment of Poona. Compiled in the Quartermaster-General's Office, 1879. Scale 200 yards to 1 inch. On 2 sheets. Size 40 inches by 39. Plan of the Cantonments of Poona and Kirkee. 1879. Scale 5 inches to 1 mile. Size 31 inches by 39.—City of Poona. Surveyed in 1869–72, under the superintendence of Mr. R. E. H. Light. Scale 200 feet to 1 inch. On 4 sheets. Size 58 inches by 72.—Bombay, Sind Division: Map of the Town and Environs of Sukkur. Reduced from Surveys undertaken in the years 1876, 1877, under the superintendence of Colonel G. A. Laughton, Bombay Staff Corps. Scale 300 feet to 1 inch. On 2 sheets. Size 62 inches by 47. Including the Island of Bukkur and part of Rohri.—Palanpur Agency: Country 20 miles round Deesa. Scale 4 miles to 1 inch. Size 15 inches by 14.—Portuguese Territory: Map of the Portuguese Territory of Goa, showing also the principal places of Sattari (in Savantvadi), the whole examined and revised under the immediate superintendence of Lieutenant James Garling, of Madras, in the year 1814. Corrected and divided into Provinces by C. S. R. Nunes. Poona, 1877. Scale 2 miles to 1 inch. On 2 sheets. Size 38 inches by 25.—Aden: Sketch of Towella and Kussaf Valleys. 1879. Scale, 200 yards to 1 inch. Size 21 inches by 16.—Madras: Cuddapah District. Map of the Jammulamadugu [Jammalamadugu] Taluq, Cuddapah District. Reduced from the Maps of the Revenue Survey, completed in 1872. By F. C. Puckle, Esq., M.A., Deputy Superintendent. Scale 1 mile to 1 inch. Size 34 inches by 44.—Map of the Budvail [Badvel] Taluq, Cuddapah District. Reduced from the Maps of the Revenue Survey, completed in 1874. By Lieutenant-Colonel W. Crewe, Staff Corps, and F. C. Puckle, Esq., M.A., Deputy Superintendents. Scale 1 mile to 1 inch. On 2 sheets. Size 40 inches by 54.—Map of the Cuddapah Taluq, Cuddapah District. Reduced from the Revenue Survey, completed in 1873. By F. C. Puckle, Esq., M.A., Deputy Superintendent. Scale 1 mile to 1 inch. Size 40 inches by 54.—Map of the Poddutur [Proddutur] Taluq, Cuddapah District. Reduced from the Revenue Survey, completed in 1872. By Lieutenant-Colonel W. Crewe, Staff Corps, and F. C. Puckle, Esq., M.A., Deputy Superintendents. Scale 1 mile to 1 inch. On 2 sheets. Size 40 inches by 40.—Map of the Pullampet Taluq, Cuddapah District. Survey Office, Madras, 1877. Scale 1 mile to 1 inch. On 4 sheets. Size 56 inches by 42.—Map of the Rayachoti Taluk, Cuddapah District. Surveyed and mapped under the direction of F. C. Puckle, Esq., Deputy Superintendent, Madras Revenue Survey. Completed in 1873 and 1875. Published in 1879. Scale 1 mile to 1 inch. On 4 sheets. Size 42 inches by 60.—Map of the Sidhout [Siddhavattam] Taluq, Cuddapah District. Reduced from the Maps of the Revenue Survey, completed in 1874. By F. C. Puckle, Esq., M.A., Deputy Superintendent. Scale 1 mile to 1 inch. On 2 sheets. Size 40 inches by 50.—Kistna District: Map of the Kistna District. Reduced from the Revenue Survey Maps. Chepauk, 1874. Scale 2 miles to 1 inch. On 8 sheets. Size 60 inches by 86.—Nellore District: Map of the Nellore Taluk, Nellore District. Reduced from the Maps of the Revenue Survey. Surveyed in 1861 and 1862. By F. C. Puckle, Esq., M.A., Deputy Superintendent Scale 1 mile to 1 inch. On 2 sheets. Size 40 inches by 44.—North Arcot District: Map of the Arcot Taluq, North Arcot District. Reduced from the Maps of the Revenue Survey, completed in 1874. By W. Beaumont, Esq., Deputy Superintendent. Scale 1 mile to 1 inch. On 2 sheets. Size 40 inches by 48. —Map of the Arni Jagir, North Arcot District. Scale 1 mile to 1 inch. Size

40 inches by 27.—North Arcot District: Kalastri [Kalahasti] Zemindari. Scale 1 mile to 1 inch. On 4 sheets. Size 60 inches by 53.—Map of the Vellore Taluq, North Arcot District. Survey Office, Madras, 1876. Scale 1 mile to 1 inch. On 2 sheets. Size 40 inches by 54.—Map of the Wallajah [Walajapet] Taluq, North Arcot District. Central Survey Office, Chepauk, 1876. Scale 1 mile to 1 inch. On 2 sheets. Size 40 inches by 54.—Salem District: Map of the Attur [Atur] Taluq, Salem District. Reduced from the Maps of the Revenue Survey, completed in 1862. By Captain W. H. Hessey, 21st Madras Native Infantry, and W. Beaumont, Esq., Deputy Superintendents. Scale 1 mile to 1 inch. On 2 sheets. Size 40 inches by 42.—Map of the Namakal Taluq, Salem District. Reduced from the Maps of the Revenue Survey, completed in 1872, by Lieutenant-Colonel W. H. Hessey, 21st Madras Native Infantry, Deputy Superintendent. Scale 1 mile to 1 inch. On 2 sheets. Size 40 inches by 53.—Map of the Salem Taluq, Salem District. Reduced from the Maps of the Revenue Survey, completed in 1867. By Major W. H. Hessey, 21st Madras Native Infantry, Deputy Superintendent. Central Survey Office, Madras, 1876. Scale 1 mile to 1 inch. On 4 sheets. Size 48 inches by 48.—Map of the Shervaroy [Shevaroy] Hills, Salem District, Madras Presidency. Survey Office, Madras, 1877. Scale 1 mile to 1 inch. Size 20 inches by 22.—Map of the Trichengode [Tiruchengode] Taluk, Salem District. Survey Office, Madras, 1878. Scale 1 mile to 1 inch. On 2 sheets. Size 40 inches by 54.—Tinnevelly District: Map of the Tinnevelly District. Reduced from the Revenue Survey Maps. Central Survey Office, Chepauk, 1874. Scale 2 miles to 1 inch. On 4 sheets. Size 48 inches by 62.—Map of the Ambasamudram Taluq, Tinnevelly District. Reduced from the Revenue Survey, completed in 1871. By Major W. Barber, 33rd Madras Native Infantry, and H. C. Puckle, Esq., M.A., Deputy Superintendents. Scale 1 mile to 1 inch. Size 35 inches by 46.—Map of Ettiyapuram [Etaiyapuram] Estate, Tinnevelly District. No date. Scale 1 mile to 1 inch. On 4 sheets. Size 50 inches by 46. —Map of the Nanganeri [Nanguneri] Taluq, Tinnevelly District. Reduced from the Maps of the Revenue Survey, completed in 1872. By F. C. Puckle, Esq., M.A., Deputy Superintendent. With a list of villages. Scale 1 mile to 1 inch. On 1½ sheets. Size 48 inches by 41.—Map of the Ottapidaram [Otapidaram] Taluq, Tinnevelly District. Reduced from the Map of the Revenue Survey, completed in 1872. By F. C. Puckle, Esq., M.A., Deputy Superintendent, and Captain W. Freeth, R.A., Acting Deputy Superintendent. Scale 1 mile to 1 inch. On 4 sheets. Size 72 inches by 52.—Map of the Sankaranainarkovil [Sankaranainarkoil] Taluq, Tinnevelly District. Reduced from the Maps of the Revenue Survey, completed in 1872. By F. C. Puckle, Esq., M.A., and Captain J. G. Cloete, 31st Light Infantry, Deputy Superintendents. Scale 1 mile to 1 inch. On 2 sheets. Size 40 inches by 42.—Map of the Sattur [Satur] Taluq, Tinnevelly District. Reduced from the Maps of the Revenue Survey, completed in 1875. By Lieutenant-Colonel W. Crewe, Staff Corps, and H. Gompertz, Esq., Deputy Superintendents. Scale 1 mile to 1 inch. On 2 sheets. Size 40 inches by 46.—Map of the Strivilliputtur [Srivilliputur] Taluq, Tinnevelly District. Reduced from the Maps of the Revenue Survey, completed in 1874. By F. C. Puckle, Esq., M.A., and H. Gompertz, Esq., Deputy Superintendents. Scale 1 mile to 1 inch. On 2 sheets. Size 40 inches by 46.—Map of the Tenkarai Taluq, Tinnevelly District. Reduced from the Maps of the Revenue Survey, completed in 1872. By F. C. Puckle, Esq., M.A., Deputy Superintendent. Scale 1 mile to 1 inch. On 2 sheets. Size 34 inches by 44.—Map of the Tenkasi Taluq, Tinnevelly District. Reduced from the Maps of the Revenue Survey, completed in 1872. By Captain J. G. Cloete, 31st Light Infantry, Deputy Superintendent. Scale 1 mile to 1 inch. On 2 sheets. Size

40 inches by 54.—Map of the Tinnevelly Taluq, Tinnevelly District. Reduced from the Maps of the Revenue Survey, completed in 1866. By Major W. Barber, 33rd Madras Native Infantry, Deputy Superintendent. Scale 1 mile to 1 inch. On 2 sheets. Size 36 inches by 46.—Trichinopoly District: Map of the Trichinopoly District. Survey Office, Madras, 1877–78. Scale 2 miles to 1 inch. On 4 sheets. Size 50 inches by 56. (*Stanford, agent.*)

NOTE.—The names in brackets [ ] are authorised spellings.

Linde, F.—Map of the Tea-producing Tracts in India. Compiled from the Revenue Survey Maps, from personal surveys, and from reports by a number of Tea planters, and inscribed by permission to H.E. The Right Hon. Lord Bulwer Lytton, G.M.S.I., Viceroy and Governor-General of India. Scale 1:200,000 or 2·7 geographical miles to an inch. With 8 inset Maps; accompanied by letterpress. 1st edition. Calcutta, 1879. Price of Map on 3 sheets, with letterpress, 2*l.* 12*s.* 6*d.* (*Stanford.*)

Petermann's 'Geographische Mittheilungen.'—Itinerar-Skizze des Nakasendo von Otsu bis Tokio. Nach eigenen Aufzeichnungen von E. Knipping, 1875. Scale 1: 250,000 or 3·4 geographical miles to an inch. 3 sheets. Petermann's 'Geographische Mittheilungen.' Ergänzungsheft No. 59. Taf. 1, 2, and 3. Justus Perthes, Gotha, 1880. (*Dulau.*)

Saunders, Trelawney.—Stanford's New Map of Kabul and the country round as far as Kohistan, Tagao, and Lughman; Gandamak, Kurram, and Shutargardan; the Upper Logar; Maidan and Argandi; with the sites of all the recent conflicts. Scale 1:125,000 or 1·7 geographical mile to an inch. Published by Edward Stanford, London, 1880. Price, in sheet, 6*s.*; in case, 10*s.*

This map is executed in a bold style, which brings into marked prominence the several mountain ranges; and clearly indicates the important part they must play in any military operations undertaken in Afghanistan. It is free from the confused mass of hill shading so frequently met with in maps, which fails to convey to the mind any definite idea of the topography of the country it is intended to represent. The routes of General Roberts in the present campaign, and that of Lieutenant Vincent Eyre, and the captive ladies in 1842, are distinguished by red and blue lines, and will doubtless be received with peculiar interest at the present time.

Wyld, James.—Country around Caubul, Jelalabad, and the Kuram. Scale 1: 253,440 or 3·4 geographical miles to an inch. Published by James Wyld, London. February 28th, 1880. Price 6*s.* in sheet, 8*s.* in case.

This map shows all the main routes to Kabul and many of the native paths, the former being distinguished by red, and the latter by thin black lines. Where any difficulty might arise as to the routes, the name is given; this is also the case with the passes, and a short explanatory table of native geographical terms is also given.

AFRICA.

A.B.C.F.M. Boston.—Map of Central and Southern Africa. Published by the A.B.C.F.M. Boston, 1880. Scale 1:3,500,000 or 47·6 geographical miles to an inch.

This map is well calculated for the purpose of illustrating lectures; it shows the whole of the African continent south of the fifth degree of north latitude; there is no attempt made to enter into detail, the only names given being those of the principal mountains, lakes, rivers, countries, &c.; the lettering is bold, and the map is 5 feet square (nearly). At the foot of the map a section is given of the elevations between Benguela and Bagamoyo. In any room of ordinary size the main physical features could be plainly discerned. An edition of this map, printed on calico, has also been published by the American Board of Foreign Missions, in which form it is easily rolled up into a small space, and is but little liable to be torn. It is hoped that it may prove useful to lecturers, who will find no difficulty in taking this map about with them.

Charmetant, R. P. Fx.—Carte partielle des Missions de l'Afrique Équatoriale, dressée par le R. P. Fx. Charmetant, Missionnaire Apostolique d'Alger, 1879. Scale 1:2,600,000 or 35·7 geographical miles to an inch. Publié par les Missions Catholiques, 1879. Paris.

Flegel, Ed. Robert.—Map of the Benue River, from Djen to Ribago, as explored by the Expedition under Mr. J. H. Ashkroft, of the Church Missionary Society, 8th July to 27th September, 1879; by Ed. Robert Flegel. Scale 1:73,000 or 1 geographical mile to an inch. 7 sheets. C. Hellfarth, Gotha, 1880.

This is a route survey, the positions are all fixed by compass bearing, and the estimated distance run. The map is in 7 sheets and commences at Djen in the west, and ends at Gurua on the east, for though in the title of the map it mentions Ribago as its farthest eastern limit, yet in reality the survey ended at Gurua, and here also the soundings end, the journey on to Ribago being made in a canoe, and no bearings or soundings being taken. At sheet 5 this survey crosses the route of Dr. Barth at the confluence of the Faro River, and the positions assigned to the mouth of the Faro by these two travellers are at variance, Mr. Flegel placing it 20′ east and 9′ south of the position given to it by Dr. Barth. This map is a most valuable contribution to our geographical knowledge of the Binue, an addition of no less than 142 miles of navigable waters, with a line of soundings taken.

Johnston, T. B., F.R.G.S., F.R.S.E., &c.—Map of South Africa, containing Cape Colony, Griqualand, Kaffraria, Basutoland, Zululand, Natal, Transvaal, Orange Free State, Damara Land, Betshuana Land, and other territories. Compiled from the best available Colonial and Imperial information, and from the Official Map recently compiled by the Surveyor-General, Cape Town; by T. B. Johnston, F.R.G.S., F.R.S.E., &c. Published by J. C. Juta, Cape Town. 1880. Scale 1:2,500,000 or 34·4 geographical miles to an inch. (*Stanford.*)

Petermann's 'Geographische Mittheilungen.'—Dr. W. Junker's Reisen in Nordost- u. Central-Afrika. Blatt No. 2: Karte der routen in den Mudirien-Rohl u. Bahr-el-Ghasâl, sowie Übersicht der wichtigsten neueren Reisen in den Ägyptischen Äquatorialprovinzen. Entworfen u. gezeichnet von B. Hassenstein. Scale 1:2,500,000 or 34·4 geographical miles to an inch. Petermann's 'Geographische Mittheilungen,' Jahrgang 1880, Tafel 4. Justus Perthes, Gotha 1880. (*Dulau.*)

—— Originalkarte des Mittleren Benuë-Stromes, aufgenommen von E. R. Flegel, Mitglied der Church Missionary Society's Expedition, unter Mr. J. H. Ashkroft, Juli bis Sept. 1879. Scale 1:300,000 or 4·1 geographical miles to an inch. Petermann's 'Geographische Mittheilungen,' 1880, Tafel 7. Justus Perthes, Gotha. (*Dulau.*)

AUSTRALIA.

Abbott, W. H.—Rainfall Map of South Australia for 1878. Drawn by W. H. Abbott, under the direction of Charles Todd, C.M.G., F.R.A.S., Government Astronomer. Observatory, Adelaide, September 1879. Scale 1:2,000,000 or 27 geographical miles to an inch. Surveyor-General's Office, Adelaide. With 10 pages of letterpress.

CHARTS.

Admiralty.—Charts published by the Hydrographic Department, Admiralty, in January and February, 1880.

No.	Size.		Inches.	
351	m	=	0·9	Australia, east coast: Percy islands. Price 1*s.* 6*d.*
	m	=	3·0	
	m	=	5·9	
2089	m	=	0·17	Africa, east coast:—Sheet 1, Tugela river to Delagoa bay. Price 2*s.* 6*d.*

No.	Size.		Inches.	
797	m	=	0·1	North America lakes:—River St. Lawrence, Quebec to Kingston; with lake Ontario and lake Champlain. Price 3*s.*
1763	m	=	1·0	China, east coast—Ou-kiang:—Wên-chau port and approaches. Price 2*s.* 6*d.*
1812	m	=	1·5	Africa, east coast:—Kiuyu, George, Cockburn, ports. Chaki Chaki bay. Price 2*s.* 6*d.*

No. 2350. Plan of Cairns harbour added. No. 292. Plan of Long and Story harbours added. No. 134. New plan of Havannah harbour added.

CHARTS CANCELLED.

No.		Cancelled by	No.
351	Percy island	New plan, Percy islands ..	351
2089	Tugela river to Sordwana point	New chart, Tugela river to Delagoa bay	2089
2090	Sordwana point to Delagoa bay		
1763	Wan-chu river	New chart, Wên-chau port and approaches	1763
1812	Cockburn, George, and Chak-chak ports..	New plan, Kiuyu, George, ports, &c.	1812

CHARTS THAT HAVE RECEIVED IMPORTANT CORRECTIONS.

No. 1923*b*. North America, west coast:—Cape Caution to port Simpson, southern portion. No. 631. South America, Chili:—Smyth channel, from south entrance to Fortune bay. No. 28. England, South coast:—Salcombe river. No. 1670*a*. Australia, east coast:—Moreton bay. No. 2304. Norway:—Karmö to Bergen. No. 87. Portugal:—Cape Finisterre to cape St. Vincent. No. 739. India, west coast:—Boria Pagoda to A'chera river. No. 755. India, west coast:—False point anchorage. No. 936*a*. Pacific ocean:—New Caledonia, north-west part. No. 936*b*. Pacific ocean:—New Caledonia, south-east part. No. 152. Bay of Bengal:—Preparis, north channel. No. 1189. Mediterranean:—Bonifacio strait. No. 163. Sardinia island:—Ports and anchorages on north and east coasts. No. 292. North America, east coast:—Harbours in Newfoundland. No. 2350. Australia, north-east coast: Double point to cape Tribulation. No. 134. Pacific ocean:—New Hebrides islands. No. 834. Bengal bay:—Rangoon and Bassein or Negrais rivers. No. 2121. New Guinea: Freshwater bay to Round head. No. 2122. New Guinea:—Round head to Orangerie bay. No. 2123. New Guinea:—Orangerie bay to Bramble haven. No. 1598. English channel. (*J. D. Potter, agent.*)

Indian Marine Survey.—Chart No. 1218. India, East Coast, Gulf of Manār, Tuticorin Roadstead and Harbour. Surveyed by Mr. Morris Chapman, late I.N., and assistants. 1879. Published at the Marine Survey Department, Calcutta, December 1879. Price 2*s.*

ATLASES.

Andree, Dr. Richard.—Allgemeiner Handatlas in sechsundachtzig Karten mit erläuterndem Text. Velhagen and Klasing. Bielefeld. 1880. Part 1. Price 2*s.* (*Dulau.*)

This Atlas will be published in 10 monthly parts, price 2*s.* each.

Stieler, Adolf.—Hand-Atlas über alle Theile der Erde, neu bearbeitet von Dr. August Petermann, Dr. Hermann Berghaus und Carl Vogel. Parts 13 and 14. Price 2*s.* each. Justus Perthes, Gotha, 1880. (*Stanford*).

The following are the contents of the 13th and 14th Parts of the new edition of Stieler's Hand-Atlas:—Part 13.—No. 9. Land- und Wasser-Vertheilung auf der Erde in Globular-Projection. Von Herm. Berghaus. Nebenkarten

Wasser-Halbkugel. Land-Halbkugel. Erdkarte in Polar-Projectio
eigener Entwurfsart.—No. 44. Dänemark und die Dänischen Kolonie
Preussische Provinz Schleswig-Holstein. Von A. Petermann. 1:1,
Nebenkarten: Kjöbenhavn (Kopenhagen) 1:100,000. Island 1:6,
Das Dänische Grönland 1:15,000,000. Die Fär-Oer 1:1,500,000
Dänische West Indien 1:1,500,000.—No. 55. Ost-Europa. Blatt 6.
Russland und Kaukasien. Von A. Petermann 1:3,700,000. Neben
Der Ararat und seine Umgebung 1:500,000. Tiflis und Umgebung 1:

Part 14.—No. 19. Deutsches Reich in 4 Bl. Blatt 1. Von C.
1:1,500,000. Nebenkarte: Das Ruhrkohlengebeit. 1:500,000.—
Ireland. Von A. Petermann. 1:1,500,000. Nebenkarten: Dublin und
Bay. 1:150,000. Die See'n von Killarney, 1:200,000.—No. 61. Pal
Von A. Petermann. 1:1,200,000. Das Libanon-Gebiet. Von A. Pete
1:500,000. Nebenkarte: Jerusalem und Umgegend. 1:150, 000.

Swiss Federal Government.—Topographischer Atlas der Schweiz im M
der Original-Aufnahmen nach dem Bundesgesetze vom 18 Dezember 18
eidgenössischen Stabsbüreau veröffentlicht. Scale 1:25,000 or 2·9 inch
geographical mile. Part 14, containing 12 coloured maps. Price 13*s.* (*D*

From the inquiries that have been made from time to time, there
appear to be a very general misconception with reference to the autho
which this atlas is based, and also with regard to the manner in whi
published; it may therefore not be out of place to give here a short
statement on these subjects. This atlas is published by the Federal G
ment, and is not a private undertaking. The scales adopted are as foll
for the districts of the high Alps, 1:50,000, for the districts of the Lo
1:25,000. The drawing of the sheets of this Atlas is almost identical wi
of the original sheets composing the Topographical Map on the
1:100,000, by General Dufour; it is in fact a reproduction (as to the Lo
on the original scale, as to the Alpine Districts on a reduced scale) of the
drawings executed under the superintendence of General Dufour
1:100,000 map; with such additions and corrections as time and the
knowledge of the glacier region have rendered necessary.

Valverde y Alvarez.—Atlas Geográfico Descriptivo de la Peninsula Ibéric
Baleares, Canarias y Posesiones Españolas de Ultramar, por el comandante gr
Capitan de Infanteria D. Emilio Valverde y Alvarez. Madrid, 1880. (*Du*

The four sheets of this new Atlas (which are now published) are:—Pr
de la Coruña, Provincia de Lugo, Provincia de Pontevedra, and Provi
Orense. These maps are on the scale of 1:750,000 or 10·3 geographica
to an inch, and show all means of communication by land, lighthouses, a
capacity of the seaports; much of the space is occupied by the letterpress,
contains a general and historical description of each province, and nu
statistics.

EDUCATIONAL.

Society for Promoting Christian Knowledge.—Map of New Zealand,
lished under the direction of the Committee of General Literature and Edu
appointed by the Society for Promoting Christian Knowledge and of the N
Society. Scale 1:1,130,000 or 15·4 geographical miles to an inch. E. St
London, 1880. 4 sheets. Price 10*s.* 6*d.*

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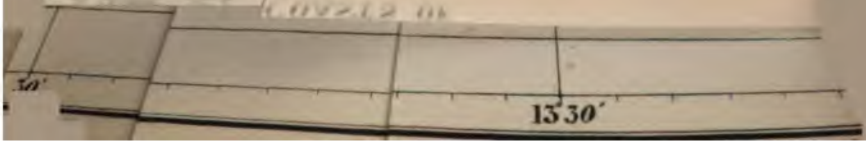
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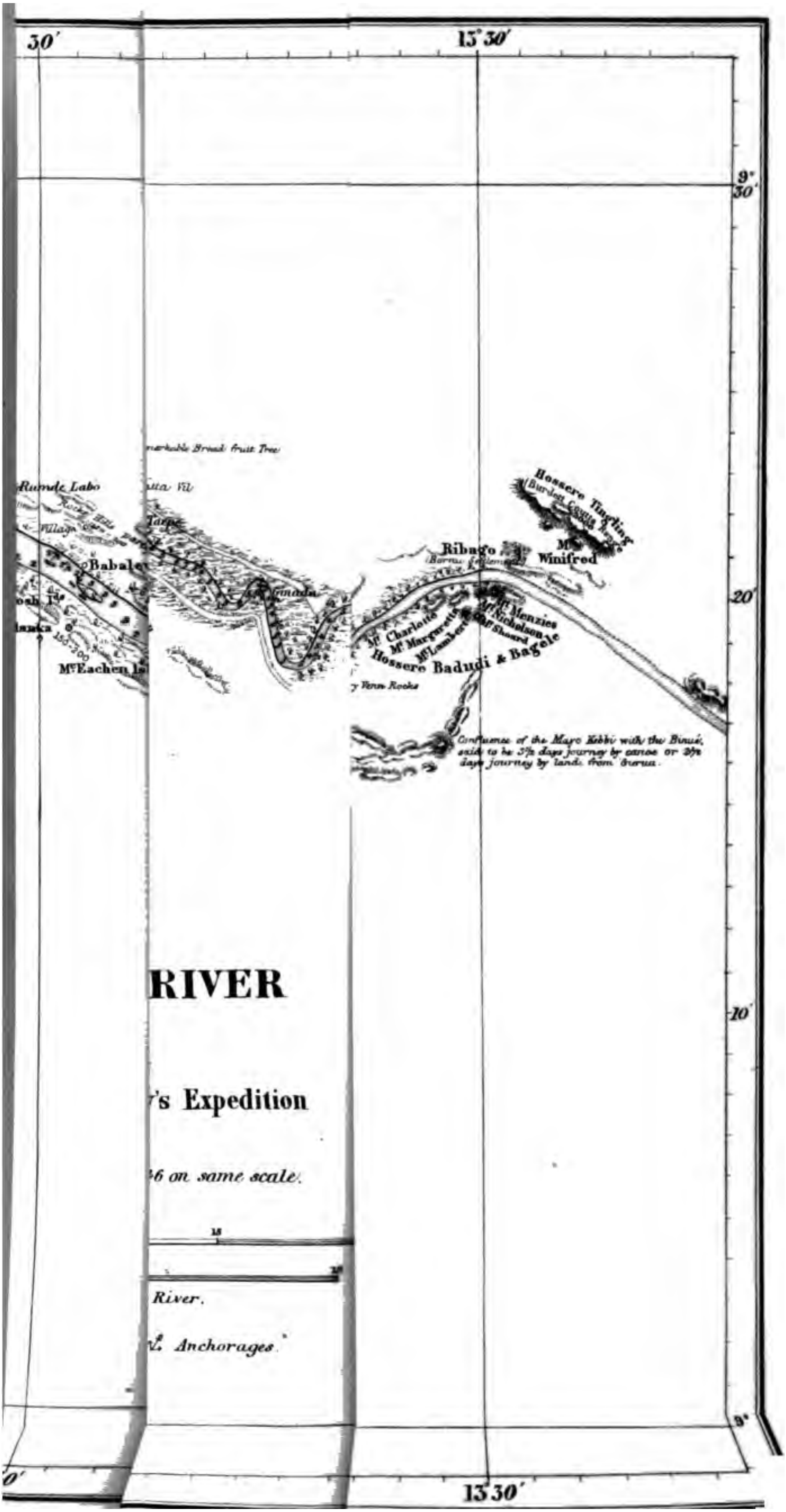
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Mt. Lambert
Mt. Menzies
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y Venn Rocks
Confluence of the Mayo Kebbi with the Binué, said to be 3½ days journey by canoe or 2½ days journey by land from Gurua.
RIVER
's Expedition
46 on same scale.
15
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River.
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PROCEEDINGS
OF THE
ROYAL GEOGRAPHICAL SOCIETY
AND MONTHLY RECORD OF GEOGRAPHY.

Masasi and the Rovuma District in East Africa.

By the Rev. Chauncy Maples, M.A., Universities' Mission.

(Read at the Evening Meeting, April 12th, 1880.)

Nearly three years and a half have elapsed since our Universities, Mission to Central Africa founded the village of released slaves at Masasi. It is a matter for regret that during that time we have done so little towards exploring the country that lay beyond us. But it must be remembered that if after three years we have but little to contribute to geographical science, our first duties and cares as missionaries were concerned with the people in whose midst we had settled, and these left us but little time to devote to travelling. As opportunity occurs, we hope to develop a line of mission stations extending to the shores of Lake Nyassa, and in order that we may plant such stations to the best advantage, it is necessary for us to travel and explore for ourselves the country, and to find out where are the great centres of population and which are the people most likely to welcome us amongst them. Thus missionary journeys, which are in fact journeys of exploration, must for some years to come form a part of our work, and as the result of these we may hope from time to time to help towards making known a country little visited hitherto. As yet, I can only speak of one such journey, which I shall describe after I have given some account of Masasi itself and the road thither.

Masasi is rather the name of a district than of a town. Speaking roughly, it lies in 11° S. lat. and 38° E. long., and at about 120 miles south-west from Lindi. It consists of four mountains lying east and west, rising out of a dense forest. Between the first and second mountains, travelling eastward, there is a well-cultivated valley, and again, between the second and the third and fourth, these last two being, to speak more accurately, two peaks of one mountain. The extent of the inhabited district may be about nine miles from east to west, with an average width of four miles. Around the base of the mountains and still at some elevation above the forest level, there are a number of huge granite rocks rising up bare to the sky, and in several cases reaching a height of from 500 to 600 feet. Near to these rocks and on all sides of the mountains are clustered the villages and gardens of the Yaos and Makuas.

Our own village is situate at the western extremity of Masasi, close to the largest of the granite rocks. If we walk westward from our settlement we almost at once plunge again into the vast forest, which stretches away on all sides as far as the eye can reach, and in one direction in an unbroken line to the shores of the lake. The height of the loftiest of the Masasi mountains is scarcely more than 2000 feet above the level of our village, which itself is, according to a barometrical reading, 1800 feet above the sea. The fine position of Masasi, its elevation above the sea-level, and its freedom from swamps and stagnant water—all the little streams that drain from the mountains making their way swiftly to the distant Rovuma—naturally suggest the reason of what seems now to be an ascertained fact, namely, the healthiness of the place, and its superiority in this respect to any spot either in Zanzibar or on the mainland where we have established ourselves. It is our opinion that Masasi in point of the salubrity of its climate may contrast favourably with any known locality in tropical Africa.

The first eight miles of the journey to Masasi, when taken from Lindi, may be made by water. It is our usual plan to follow the course of the Lindi River as far as a place called Liawa, where a wealthy Arab has built himself a fine house, and possesses large plantations of cereals and fruit trees. The river, which up to this point is a broad stream, ceases to be navigable a very short distance higher up, and quickly becomes an insignificant rivulet, which nevertheless must have its source at a considerable distance, for we meet with the stream again shortly before reaching Masasi. The name of the river is the Ukeredi. It runs through a deep valley to the south of the direct route to Masasi, and then suddenly swells out into the estuary which has its embouchure at Lindi. I have been repeatedly told by the natives that on the southern shore of this estuary, and on the opposite side to Liawa, there are the ruins of an old fortress which was built there by the Portuguese. I have not been able to verify this report by a visit to the spot indicated, but there is every probability that it is true. If a road should ever be constructed to connect Lindi with Lake Nyassa, it would have to pass along the Ukeredi Valley, where no abrupt ascents or sudden declivities which are the bane of our direct route, occur, and where, as far as Masasi at least, such a road might be made with very little trouble and with small expense. Beyond our settlement again the road might traverse an almost level country for another 60 or 80 miles, while there is no reason o believe that the remaining half of the distance would present greater bstacles than those which we know to be practically of no account hroughout the first half. It is our belief that, making allowances for a etour in order to avoid hills, a tolerably level road might be made connecting Lindi with the lake at Losewa, whose length need not exceed 00 miles, and which should follow the line of population and strike irectly through the country where to this day the slave trade is briskly arried on: it would cross the Rovuma near Majeje, and at the point where the main caravan route from the lake to Kilwa strikes it, and hence through the country where the great Yao tribe has its centre to he shores of the lake.

On leaving Liawa and the Lindi estuary, we soon begin to ascend the hills and plunge into the thick tangled forest which extends in a long belt from north to south, immediately behind the coast ranges. In parts this forest is very dense, and the twisted creepers and parasitical plants that interlace and twine about each other overhead, make it necessary very often to stoop and crawl along the path. Within 20 miles of the coast this forest becomes almost entirely formed of indiarubber vines, affording an abundant supply of fine indiarubber, which at present is only gathered in a very desultory manner by the natives, when hunger and famine compel them to go to the coast and buy food. At such times they spend several days in the forest gashing the trees and collecting therefrom the indiarubber, which issues from the wounded branch in a liquid form and dries hard after a short exposure to the air: after they have rolled the rubber into about twenty balls the size of an orange, they take it to Lindi, where the Banyan merchants give them in exchange about two dollars' worth of rice or sorghum, its real value being perhaps seven or eight dollars. The width of the belt of indiarubber forest is from 15 to 20 miles where we pass through it. We were always sorry when we had left it behind us, as the cool shade it afforded, as well as the luscious fruit of the vines themselves, were most grateful to us. The dark recesses and oppressive silence of the forest, have gained for it in the eyes of the natives a kind of superstitious reverence: they speak of it by the sounding name of "Magogoro," giving to the word an almost personal meaning. Keeping along the ridge of hills which lie to the north of the Ukeredi Valley, the road leads through a very largely populated and well-cultivated district, inhabited by Makuas and Mweras. Of the Mweras we know very little, but as far as we can ascertain, the tribe is no longer a large one, having been in past times much harried and decimated by raids made upon it by the more powerful races from the south. At present the main body of the tribe lies in the country at the back of Kilwa, though it is probable that fifty or sixty years ago there were many more Mwera settlements, extending southwards to Masasi, and even to the Rovuma. Native reports tell of a great war in which the Mweras were defeated and forced into the confined space where now the remnant of the tribe is settled.

The Makuas of these parts are nearly all under one chief whose name is Abdalla Pesa, with whom we have established very friendly relations. It is said that in former years he had much more power and exercised a wider sway than he does at the present time, but even now a very large number of people owe allegiance to him, and he keeps up a lively intercourse with the coast people at Lindi. After leaving his country, the villages begin to grow scarcer and the country more rugged and wild. The next inhabited spot of any note is Mwembe, so called from a large mango-tree that stands in the village. The people belong to the Gindo tribe, and unfortunately are ruled over by a man who seems to be indebted for his position to the frequency and joviality of the beer-drinking entertainments he gives his people. He is the only man on the road who ever showed us any incivility, but as he stands in great awe of a certain Mkumba, who is now the acknowledged head of the Gindos on the Rovuma, with whom we have made friends, we anticipate no more annoyance from him. Of the Gindos I shall have more to say later on. Twelve miles beyond this man's village we come to Lijimbe, a small Mwera community, and then we leave all cultivation behind and plunge into the great Yao forest, through which we pursue our journey for another fifty miles until Masasi is reached. Very rarely did we obtain any shade in this forest; the foliage was invariably of the thinnest and lightest kind, the trees themselves being for the most part different kinds of acacia and the tamarind, varied from time to time by stretches of bamboo and shrubs. Our last encampment is by the side of the Ukeredi, which in the hot season is completely dry. At the extreme eastern point of Masasi, at the first village we arrive at coming from the coast, there is a settlement of Yaos who separated from Makanjila, the powerful chieftain near the lake, and sought a home from the Makuas. Afterwards other Yaos followed and were granted permission to settle, but the whole district is absolutely owned by Makuas, and the Yaos are only there on sufferance, as indeed are we also. It is impossible, I think, to attempt to estimate the numbers of the Makua people, but there can be no doubt that the tribe is a very large one, covering as it does five degrees of latitude and as many of longitude. We hear of them extending in their villages for at least 200 miles along the Rovuma; we have them again the ruling people at Masasi, while their great towns and real centre are 300 miles away in the latitude of Mozambique. We recognise amongst the Makuas many subdivisions of the tribe, which all have their special and distinctive tattoo marks, but one common language, of which the dialectical variations are remarkably small, binds them together. I find a vocabulary of Makua words collected by Dr. Peters (I believe at Mozambique) thirty years ago, scarcely differing from a similar collection of words made by myself at Masasi last year. Such a coincidence is worthy of notice, as restricting the theory that savage tongues are universally in such a constant state of flux, that the language spoken by one generation would not be intelligible to the next. Although nearly all the Makuas can speak Yao, it is most rare to find any native who can speak Makua unless he be a Makua by birth. With regard to most of the many languages that abound near us, it is easy for a native of one tribe to speak the language of another: but with Makua it is entirely different. The tongue of course belongs to the same Bantu family as do the others; there is nothing radically different in it, but some very striking peculiarities in its phonology are no doubt the cause of the difficulty foreigners find in acquiring it. Although the Makuas are the ruling power at Masasi, they have allowed the Yaos to persuade them that they are inferior to them in intellectual capacity and νοῦς. The Yaos are a travelled people, they have been to the coast, and, as they say, have learned a thing or two there. The Makuas, on the other hand, are a quiet stay-at-home folk, and have weakly given in to the idea pressed upon them by the Yaos that they are altogether ignorant and behind the times. Yet as a fact the Makuas contrast favourably with the Yaos in nearly every respect. The Yaos are habitually liars. The Makuas are as a rule truthful. The whole *morale* of the Makuas is far superior to that of the Yaos. Their domestic life is better, their family ties are stronger, they regard the honour of their wives. The mothers are especially watchful over their young girls, and jealously guard them from evil. With the Yaos all this is reversed. The marriage tie is set at nought; the utmost immorality prevails amongst them; and their women are almost made common property. On the whole, perhaps, the two tribes are equally industrious, but the Makuas are the more thrifty. The Makuas are again a simpler people, their chieftains live on more familiar terms with the rest of the community than do the Yaos, and yet they usually have more power and are more respected. In their councils they have an honest desire to get at the truth of a matter and to mete out justice accordingly. I could always trust a Makua chief: if he said a thing he kept to it. Not so the Yaos; shifty, sly, and deceitful in their ordinary dealings, they were equally so when sitting in council to decide matters of government or to give judgment in the various cases that from time to time arose between their people and ours. It would seem certainly that the contact of the Yaos with the spurious civilisation of the coast, where they have picked up a few crumbs of the prevailing Mohammedanism, has only served to make them more vicious than they were by nature. However this may be, it is certain that with them at least Mohammedanism has been anything but a regenerating force, and the Makuas should congratulate themselves that they are still able to eat rats with an appetite, while their proud Yao neighbours think scorn of pig and refuse to eat any animal food which has not been slain according to

Mohammedan rule. Living as we did at Masasi in a kind of village community amongst people of a different race, there often arose disputes and sometimes serious differences between our own released slaves and the people living under the Makua chiefs around us. On such occasions I always called in my friends the chiefs to confer with me as to what was to be done, and never once did I detect the slightest desire on their part to screen their own people if they felt they had been in the wrong. It would be impossible for me to over-estimate the great help they were to me in my early difficulties, or to speak too highly of the great kindness, courtesy, and attention they invariably showed us. We gave them infinite trouble at times, we kept them with us whole days together trying cases, but they grudged neither the time nor the trouble, so anxious were they always to prove to us that we were their friends and they ours in something more than name.

A very noticeable feature of the Masasi district is the fertility of the soil. The cassava attains an enormous size, while the sorghum, sesamum, and rice grown there are famous for miles round. All the water is strongly charged with iron, and an abundance of excellent salt is extracted from the moist ground at the foot of the hills. The ironstone is found in large quantities on the surface, and most of our neighbours are smiths. They smelt the iron in furnaces dug out of old ant-hills, and then forge hoes and axe-heads from the iron thus obtained. When we first settled in the country, we found the tamarind, the cashew apple, and the banana the only fruits of any importance that were indigenous, but we very soon introduced guavas, oranges, lemons, limes, pomegranates, custard-apples, mangoes, pine-apples, jack-fruit, and other fruit-trees from the coast. We have also tried to grow cinnamon, coffee, ginger, and cloves with varying success; while last year a goodly crop of English vegetables—cucumbers, peas, scarlet runners, vegetable marrows, and potatoes, was raised. Our ambition in the agricultural line is to grow wheat; as yet we have given it no trial. Masasi also affords an excellent stone in the huge boulders of granite (or, more correctly, *gneiss*), which lie about us on all sides; we have already employed this in building, and when we are able to find limestone, and so make mortar, stone buildings will probably take the place of our present light and airy bamboo houses.

I will now proceed to describe a journey I took in the month of November 1877, to the Rovuma Valley and the Makonde country. Our party comprised twenty of our best-behaved people from our own village, a young lay member of our mission staff, Mr. Joseph Williams, and myself. On starting we bent our steps at once towards the Rovuma, intending to visit on the way thither a Yao chieftain of whom we had heard much. Our course from Masasi lay about E.S.E. through the forest for 25 miles, where water was scarce and game plentiful. We crossed a small river on the second day of our journey, and immediately afterwards began to ascend the range of hills which stretch east and west between the Ukeredi Valley and the Rovuma, and soon found ourselves amongst the Yaos at Lulindi. At this spot we had to buy water, all of which is fetched from the bottom of the hills three miles distant. Making only a short halt here, we marched on till we came to a Makonde village, which seems to be built at the extreme westernmost edge of the country that tribe now occupies. The Makonde, unlike the other tribes about us, build all their houses in a circular shape and of very thick poles about 9 feet high; they build them near together, and carefully clear and weed the space that lies between them. Shortly after leaving this village the path led us to the very edge of the high mountain ridge on which we were walking, and then we obtained our first sight of the Rovuma Valley and the mountains of the Mavia people beyond it. We saw the great river, 20 miles away, winding through the forest like a long line of silver as the sun shone upon it. We traced it far away to the westward to a spot which we imagined must have been Ngomano, and the junction of its waters with those of the Lujenda, and then as it curved round to the north it was lost in the distance, and only the great granite rocks rising out of the forest, and which, we knew, lay close to its banks, told us of its further windings. From the spot where the valley first opened out before us signs of cultivation again began to show themselves, and in another two hours we had arrived at the town of the Yao chief whom we had come to visit. He came out at once to salute us, and gave us a most hearty welcome. We we were told by everyone that this man is beloved as no other chief could be loved, and certainly we ourselves were fain to acknowledge that he had quite come up to our expectations. He is without exception the most intelligent and the most pleasing African I know. He has many excellent qualities, and withal an amount of energy that is rare in that part of the world. He has a fund of information about the country, the people, and the languages, of which he can speak six. He is decidedly handsome, has a fine figure, and is considerably taller than any of his people. Perhaps the most remarkable thing about him is the fact that he is a total abstainer. He became an abstainer on principle, and has for many years never touched the native beer or any other intoxicating liquor. Those who know the habits of African chiefs, and their universal beer-drinking propensities, will at once allow that great praise is due to our excellent friend Matola for his temperance. The result of our visit to him, which we prolonged to four days, was that he promised to welcome and help any English clergyman whom I should send to Newala to teach him and his people. He was as good as his word, for six months after our visit I had the happiness of sending the Rev. Herbert Clarke to Newala, who built a house and a church there, and found in Matola a staunch friend and supporter, as wel as a most liberal host, for during the whole of the time that he was able to spend there, he incurred scarcely any expense, our good friend insisting on giving him nearly all the food he required, both for himself and the people he took with him. Matola also undertook not only to summon his people to church when the Sundays came round, but also himself to translate into the troublesome Yao language Mr. Clarke's Swahili sermons. Though Newala may be said to be under the rule of Matola, the Yaos of the place, as at Masasi, are foreigners in the land, and only dwell there by permission of the Makuas, who live in the valley about eight miles from Matola's town. We told Matola that on leaving him we were going to the Rovuma, intending to cross it, and then try and reach the Mavia who lived on the other side. He promised a guide, but advised us strongly not to run the risk of encountering the Maviti, whom, he said, we should be sure to fall in with. He expressed his great terror of them, and told me that his people dared not go to the Rovuma, except in very strong parties, for fear of being attacked and killed by them. The Maviti, he told me, were not to be confounded with the people going by the same name near the lake. It is a well-known fact that the Maviti of that district are the remnant of a Zulu army sent on a marauding excursion by Dingaan, who never made their way back to their old country, and who are to this day the terror of the peaceful tribes near the Nyassa. The Maviti of the Rovuma Valley are really refugee Gindos who live by plunder, and who two years ago made it their business to harass all who ventured near the river. They are called Maviti because they have aped the dress, the dances, and the war-like habits of the true Maviti or Zulus. It appears that, living as they did formerly near the spot where these scattered Zulus were encamped, they became so fascinated with the assegais and shields and feathers and skins with which the late war has made us familiar, that they gave up agriculture and the arts of peace for the charms of a buccaneering life, and made themselves to all intents and purposes Zulus. They betook themselves to the Rovuma Valley, where, until the treaty which we were able to negotiate between them and the representatives of three other tribes the year before last, they were the pest of the neighbourhood. While staying with Matola I was told there was a man who specially wanted to see his English visitors, because he had known something of a white man in old days, and if we were at all like him he should like to make our acquaintance. I desired that he might be presented to us. Forthwith he came, a pompous old man, who spoke in a dignified manner, and who had evidently some information to communicate. Over his right shoulder there hung an old coat, mouldy, partially eaten away, but still to be recognized as of decidedly English make and material. "Whose was it?" I thought, as he began with much mystery to tell of a white man who ten years ago had travelled with him to Mataka's town, a white man, he said, whom to have once seen and talked with was to remember for ever; a white man who treated black men as his brothers, and whose memory would be cherished all along that Rovuma Valley after we were all dead and gone. Then he described him,—a short man with a bushy moustache, and a keen piercing eye, whose words were always gentle, and whose manners were always kind, whom as a leader it was a privilege to follow, and who knew the way to the hearts of all men. This was the description this African savage (as men speak) gave of Dr. Livingstone. Then he showed me the coat; it was ragged now, he knew, but he had kept it those ten years in memory of the giver, from whom it had been a legacy when they parted at Mataka's. To no one but to an Englishman would he part with it, but he let me have it as one of Livingstone's brothers (he said), and it now lies in the museum at Charterhouse School, a precious relic of one whose heart bled for Africa, and whose life was laid down in efforts for her redemption.

Promising to return to Matola on our way back, we marched on to the Rovuma, which we forded at a place where there were numerous islets, and which, at this spot, could not have been less than half a mile wide. I calculated that our crossing was made at a distance of 120, or from that to 140 miles from the mouth of the river, and perhaps 70 or 80 miles east of Ngomano and the Lujenda junction. Arrived on the other side, we were well aware that we had entered a country which, stretching southwards towards Mozambique, is almost entirely unknown to Europeans, and we were anxious to learn something of the people who inhabited it. A flat alluvial plain lay between the river and the mountains on the south. Through this we walked in a south-easterly direction, away from the river, but not directly away from it. In a few hours we reached the hills, and found ourselves in a Makonde village. Here we halted for the night, and met with a very strange reception. The simple villagers would have it we were ghosts. In vain I offered proof after proof of my reality. It was not of the slightest use, "Whoever heard," they said, "of human beings with white skins?" It became quite aggravating at last, for, when we pressed inquiries upon them as to the road ahead of us and the Mavia people, they only smiled foolishly upon us and seemed to see no reason why they should answer the questions of shadowy unrealities. Fortunately, however, to a pretty urgent appeal for food, they responded, and I have always hoped that the way in which we caused to disappear the supply of dried fish they put before us on that hungry evening, may have persuaded them that there was bulk and substance about us after all. Ten miles beyond this village we came to the last of the Makonde settlements, on the south of the river, and from the old man who owned the village I obtained some information about the country beyond. We were then, he said, only four hours' walk from the chief town of the Mavia tribe, a people I much wished to visit. They inhabited the long mountainous range which we had seen from the other side of the Rovuma, and which lies pretty nearly east and west for 60 or 80 miles, extending from a point nearly opposite to where we had crossed the stream to within 20 miles of the coast at Delgado. A good deal of mystery hangs about these Mavia. They have some habit or custom for which the Yaos, Makuas, and other neighbouring tribes agree in laughing at them; though they utterly refused to tell us what this was. They are said also to be an extremely inhospitable people, who keep entirely to themselves, and who always refuse food and drink to strangers. One very remarkable thing about them is that their men as well as their women wear the hideous *pelele*, or lip-ring. In their own country they go perfectly naked, but don a loin-cloth when occasion necessitates a journey to other tribes. I was told that to the south of the Mavia district the country for a long distance is entirely uninhabited and abounds in elephants. My informant also said that after leaving the Mavia, the journey southward would take one, after nearly a month of travelling through a very difficult country, to Mozambique. My people were so unwilling that I should penetrate into the country of the Mavia that I at last yielded my wish to theirs, and we retraced our steps to Matola's, crossing the Rovuma again at the same place, and finding it considerably swollen. After another two days spent with our friendly host at Newala, we told him of our determination to visit the terrible and dreaded Machemba. To pay this visit was one of the main objects with which we had set out on our journey, but, I must confess, that we had some qualms as to what the issue of the visit might be. Machemba has the reputation for miles round the spot, where he now lives at the head of his robber-band, of being one of the most bloodthirsty and cruel tyrants ever known. Even at Lindi, where there is an Arab governor and a detachment of Arab soldiers, the people live in dread of his raids, for as there are no limits to his cruelty, so also there are none to his boldness. I felt it a solemn duty to take an early opportunity of visiting this man and protesting solemnly against his iniquity, and of trying to influence him to mend his ways. When our good friend Matola heard of our intention he did his best to dissuade us from going; but we could not listen to his remonstrances, and he, seeing that his efforts were unavailing, at last directed us on our road, and told us to be sure and visit him again soon. Our path lay through the Makonde country, and at all the villages where we stopped we were warmly received. The Makonde are a quiet, peaceful people. The haughty Yaos despise them, call them simpletons, and laugh them to scorn because they eat a very elegant green serpent that is common in their country; but then they think no better of us for eating eels, so that we should be sorry to think them good judges, or competent in any way to form a true estimate of their neighbours.

Three days after leaving Matola we halted at a Yao village, which was but one day's march from Machemba's own town. Here the chief man told us that he lived in perpetual dread of his cruel neighbour, though he dared not run away, lest Machemba should pursue him and put him to death. He shook his head ruefully at us when we left him the next morning, and said that he feared to stay behind, as he feared also to go with us: if he escorted us to Machemba's, the great man might be angry, and yet if he did not go with us, it was just as likely that his ire would be aroused. Finally, he determined to let us go alone. As we neared the hill where Machemba has entrenched himself, we passed through village after village which had been pillaged and burnt by this ruthless man. It was a sad sight indeed. Charred remains of walls and houses, and broken earthenware, told too plainly the story of night surprises and hasty flights, of devastation and of murder. The last of the villages past, we then made our way through the thickest bit of forest I have ever penetrated, and at length emerged in an open valley, on the other side of which I could see the path winding up the hill to Machemba's town. At the further extremity of the valley there was a watering-place, where we saw a number of gaily-dressed women washing their clothes and drawing water. Before climbing the hill, we halted for a council, and after donning some clean clothes and brushing up a bit, we fired a salute of ten guns, and then started off again in single file at a brisk pace up the hill. The guns had attracted the attention of Machemba's people, and they came swarming down the hill to see us. It was a critical moment, for it was doubtful what reception we should get; and as I looked into the countenances of the men who surrounded us, I could not help feeling a little anxious. We were at a disadvantage, knowing nothing at that time of the Yao language, but I felt there was no time to be lost in showing them that we had come on a peaceful errand; and so, happily bethinking myself of a famous Yao word for expressing surprise and admiration, I came out with it all on a sudden with as loud a voice and as much emphasis as possible, imitating as closely as I could the peculiar intonation with which a Yao would sound it. The word was "*u-u-ugwe*." It had the desired effect. They stared for a second in utter amazement, and then, as I began to smile, they positively roared with delight. They clapped their hands, they cheered, they repeated the word over and over again, they declared I was a Yao born and bred, and it was clear that we had won a great victory. The crowd swelled round us, and by the time we had reached the middle of the town it was almost impossible to estimate the numbers of the multitude that thronged us. We found that our names were well known, though they had undergone considerable corruption in the process of becoming naturalised in the Yao language. I was not a little surprised, for instance, at hearing myself greeted as "Sita pepo." As we knew it to be Machemba's custom to keep any visitor four whole days in his town before going near him, we were agreeably surprised at being told that he would be glad to wait upon us whenever we were ready to see him. Accordingly, by our desire, he came at once. He shuffled towards us rather shyly, and it was evident that his first interview with his

European guests had deprived him of his usual *savoir faire*. However, he came up to us and sat down by our side, and after an exchange of smiles he gave me a nudge which nearly upset me, and raised a laugh at our expense. I waited my opportunity, and then returned the nudge with interest. This of course turned the laugh against him, and soon we were all laughing together. It was a long time ere I could find opportunity for talking seriously to him, so persistent were the clamours on all sides that we should exhibit our guns, telescopes, watches, &c. Then I was expected to be able to give an answer to all kinds of impossible questions; to tell them, for instance, on what day the rains would begin, and what was the best form of medicine for keeping off the lions. One of these animals had been prowling on the outskirts of the town during the last week, and I was of course asked to kill it. Wishing to be agreeable, I said I should be most happy to do so, if they would tell me how to set about it. In answer to this, they took me to a small hut, which stood on four poles 20 feet high, and pointing up at it, said, "There, climb up into that hut, take your gun, wait four days or so, and the lion is sure to pass that way, then you can kill it." Time was precious, so I declined with thanks. In Machemba's town food was very dear; the most preposterous prices—ninepence and a shilling, were even asked for a fowl—so I told our host that if he expected us to remain with him for more than a day, he must feed us. To this he replied by promptly sending down to our house two fat goats and a quantity of rice. On the second day I was able to speak to him apart from his people, and to tell him the reason for which we had left Masasi to come and visit him. I told him that wherever I went I had heard of his misdeeds, of his cruel murders, and his ill-treatment of the poor Makonde people who lived around him. I told him that we English had come to make friends with all men, irrespective of tribal distinctions; and that we were already in friendly alliance with almost all his neighbours whom he had made his foes; that they had rallied round us, had listened to our counsels, and on all great matters were already showing a readiness to seek and follow our advice. I told him plainly that we had come to him on a peaceful errand, and that we wished to include him in our list of friends, but that we could not do so unless he would cease from the evil he was doing, and which had made the whole country cry out against him. He promised amendment in this respect, and we have been told that the Makonde have almost ceased to fear him since our visit. We had also a long conversation on the subject of the slave trade. He is, as is well known, the great slave dealer of these parts. I myself have seen a caravan of 500 Yao and Nyassa slaves whom his headman was bringing him from Mtarika's on the Lujenda. When he saw that we were well acquainted with his slaving propensities he honestly confessed it all, and added that so long as the Arabs brought powder and cloth and beads to his town and only ıted slaves in exchange, so long would he continue the traffic; but gladly assented when I asked him whether he would give ivory and al and indiarubber in exchange for the European commodities if h things were asked for. It is clear to me that the demand for es must be absolutely stopped, before the slave trade will be finally hed out in the interior of Africa. It is vain to suppose that at the sent time slaves are not being exported, because the dhow loads of n which are now captured by our cruisers on the east coast are few far between. We who live in the country and who see before our the caravans actually passing down to the coast, are bound to tell fferent tale. I should have mentioned that Machemba, of whom I now speaking, is the same man of that name whom Livingstone te about in his journals. At the time Livingstone made his last ney in Africa, Machemba was settled near the banks of the Lujenda, east 250 miles further from the coast than the spot he now occupies. present locality, where I visited him and where he has been blished about eight years, is equidistant from Mikindani and Lindi, miles from either port, and, I think, due east from Masasi and rly 80 miles distant from us. Machemba was the bitter enemy of aka, the well-known Yao chief who lived near the eastern shores ake Nyassa, but his great agent for the supply of slaves is Mtarika, now lives ten days' journey from Masasi, on the River Lujenda. man procures slaves from the Nyassa people as well as from his Yao tribe, and it is therefore likely that he sends long distances harries a wide extent of country to procure numbers large enough tisfy Machemba's demands. While speaking of the Lujenda, I may that all the time I was at Masasi I tried to find out where it rose what were its conditions above the spot where it is known. I got very definite answer to my queries, but several men whom I rrogated agreed in saying that it flows out of a lake which would eached by following the stream for twenty days beyond the place re Mtarika has posted himself, also that there are many rapids and nds in the river, and a long series of Yao villages extending for s along its banks.

We spent four days with Machemba, and then with some little culty persuaded him to let us leave him. He very liberally gave large lion's skin, which, I was told, he much prized, and allowed to carry off his own son and two other boys to be educated in our ols, and, as he said, as a pledge of good-will. Almost the entire lation of the place escorted us down the hill into the valley where had halted on our way four days before. There we fired a farewell te, and retraced our steps to Masasi, which we reached in five days, ing completed a circuit of about 250 miles, and having been away home just three weeks. The friends we made on our journey did forget us, nor we them. In Matola we have to this day a most devoted ally and a very staunch friend. Machemba constantly sends his most influential men to visit us and to ask us when we are going to send one of ourselves to settle amongst his people. It is well understood and thoroughly believed now that he will never again molest anyone who has known and visited and made friends with us. Although I could not truthfully speak of him as a thoroughly reformed character, I can certainly say, on the authority of Yaos, Makuas, and Makondes, that he is no longer the terror to the country that he was formerly.

The results of the journey I have now described were, from a missionary point of view, very considerable, though the subject does not allow of my speaking of them here, save only to remark that, being as they were, we have been encouraged to consider that such journeys may, or rather must, for some time to come form a part of our own direct missionary work. We may therefore hope to aid in throwing light in more senses than one on a country which has not yet outgrown its happily-conferred title "the Dark Continent."

The following discussion took place:—

Rev. Horace Waller said he was sure that everyone present must have been delighted with the paper which had just been read. If the author had withheld some facts which would have given additional interest to the paper, it was because he had a delicacy in bringing before scientific men those more immediate objects which led him into these regions. It might be known to many of the members that Dr. Livingstone for some time entertained an idea that the Rovuma carried off some of the waters of Lake Nyassa, and he stuck to it with dogged courage, hoping after all to turn the laugh against geographers. But as he travelled inland, he found that he must abandon the idea altogether. The centre of the country was very elevated, and all the rivers had cataracts. If only one stream could be found without cataracts, Central Africa would be much more easily opened up. He was glad to find Mr. Maples bearing similar testimony with regard to the Yao tribe to that which had been borne by other travellers. They had characteristics which were all their own, being a merry, light-hearted people. They were much coveted by slave-dealers, for if they were sold before they were more than eighteen or twenty years of age, they quickly settled down wherever they were taken; whereas the tribes on the west of Nyassa were of a gloomy disposition, and unless taken as children were apt to pine away in slavery. They used to be spoken of as an "apple-headed race," their heads being very remarkable when contrasted with the long-headed tribes to the south of the lake. They had just room for some brains, but certainly a phrenologist would say there was no depth of feeling, or kindness, or nobility in them. They were always willing and anxious to take part in any rascality that was going on, and were much sought after by the Arabs to join them in their forrays. Bishop Steere's missionaries always seemed to go where there was most need of light, and he was sure they were doing good service in visiting the Yaos, who, as a rule, were the most detestable characters in that part of Africa. Some of them, however, had proved themselves very remarkable exceptions. Their great delight in travelling could be turned to account, and when their boys were properly trained, they made excellent guides. The Geographical Society was greatly indebted to one of them, James Chuma, who, in company with a Zambesi man, when Dr. Livingstone died, arranged to bring his body to the coast, with his valuable notes and maps. The Society, therefore, owed something to this wild, roving, harumcarum Yao tribe. A few weeks ago two exploring parties were engaged in what looked like a race from Nyassa to Tanganyika, for curiously enough Mr. Thomson and the Scotch Missionary Expedition arrived there within twenty-four hours of each other. The latter was headed by a Yao named Chimlolo, who for thoroughness at all points could not be surpassed under either a white or a black skin. It was his (Mr. Waller's) great pleasure to be present when Chuma was first liberated. At that time three yards of calico would have made him change hands, but he had greatly increased in value since that time. Chimlolo, the leader of the Livingstonia Expedition, was really saved by his wife. She had been taken prisoner by some Makololos, who brought her, with a number of other captives, to the village where Bishop Mackenzie's party lived. She quickly got over the idea that she was about to be eaten, and she brought the man to whom she was engaged from a neighbouring village, and requested to be allowed to settle down. From that day to this, Chimlolo had been of inestimable advantage to every Englishman who had visited that district. He hoped that the Royal Geographical Society would before long make some tangible acknowledgment to Chuma and Chimlolo. When Bombay served Speke and Grant so well, care was taken to provide for him for the rest of his life. Chuma was now with Mr. Thomson, and when the Society's expedition returned to the coast he had no doubt that that gentleman would corroborate all that had been said in the young fellow's favour. Mr. Maples might have added one or two remarks which would have been of great interest to geographers. For instance, he had said nothing about the temperature of the high land between Lake Nyassa and the coast. He said this because he knew that a great many eyes were now fixed on that country. Those who had attended the meetings of the Society must be aware that there seemed to be a sort of focussing of scientific and missionary interest on that part of Africa between the Tanganyika and Nyassa lakes. Already the Livingstonia party had made themselves very well acquainted with Lake Nyassa to the south. At Blantyre, to the south of the lake, there was a Scotch mission, and there were other missions further to the north. The slave trade had been crippled to an enormous extent during the last few years, mainly owing to Dr. Livingstone's travels and the light he threw on the subject, but also owing to the earnestness of the Sultan of Zanzibar, to whom too much credit could not be given for what he had done. He could not omit to mention also the labours of Dr. Kirk at Zanzibar. When the history of Africa came to be written, some one more discerning, perhaps, than politicians of late, would point out that to Dr. Kirk the negro race was more indebted than to any other man living at the present day. The mantle of Dr. Livingstone had fallen upon Dr. Kirk, and no man had more thoroughly devoted twelve years of his life to ameliorating the condition of his fellow-creatures. But when missionaries who made their way to these lakes found themselves in an embarrassing position with the slave traders, there was no English officer or Consul who could represent officially what they were doing to the Government. What he wanted to see was some officer of the Navy or the Consular Service allowed to go to Nyassa, with a floating commission to report to the outer world what was going on at the roots of the slave trade. He would do more in twelve months to put a stop to the horrors connected with it than all the vessels on the coast.

Sir Fowell Buxton said the meeting must have been greatly struck by the important geographical information which they had heard from Mr. Maples, in reference to the country lying between the east coast and Lake Nyassa. The chief difficulties appeared to lie in getting to the lake region; between the lakes the difficulties to be encountered were much fewer. Everything therefore which tended to bridge over the space between the coast and the lakes, must be welcomed as a great help to the development of civilisation and trade. Lake Nyassa was nearer the sea than any of the other lakes; and there was also access to it by the Zambesi, and the

Custom-house impediments which lay in the way of Dr. Livingstone and Mr. Waller had been mostly removed. Mr. Maples and his colleagues had done a great deal to make the name of Englishman respected in the district, and future travellers there would, in consequence, owe much to them. With regard to the slave trade the most important question to settle was where the slaves went to. Probably many of them were taken to the tribes to the north of Zululand, or even Zululand itself; but he did not think that any great number reached the sea with a view to being transported to Arabia and the Indian Ocean. It was quite possible that the development of industry on the coast might for a time tend to develop the slave trade. As the chiefs took to cultivation they might find labour increase in value, and while they would be less inclined to sell their own people they might be more ready to buy others.

Colonel Grant said that Bombay and one-third of their porters belonged to the Wa-yao tribe of whom Mr. Maples had spoken. Bombay not only served under Captains Burton and Speke, but he also accompanied Speke and himself, Stanley, and Cameron, and he was now one of the pensioners of the Society. Recently he had written a letter to him (Colonel Grant) saying he had a great desire to come to England and see what kind of a country it was. No doubt at some time or other the Fellows of the Society would see him, and understand what kind of man a thorough-going, honest M'yao was.

Rev. Mr. Randolph said he had been as much pleased as anybody possibly could be with the account which Mr. Maples had given of his marvellous journey. With one thing he had been particularly struck, namely, the manner in which the difficulties of the travelling had been concealed. The question of the roadways should be considered by all who wished well to Africa. It was not the duty of missionaries to turn road-makers, but their work would be immensely helped, if it were rendered possible to reach Masasi without having to walk with bodies bent down to avoid the exuberant tropical undergrowth. A practicable road would also be the very best means of opening up the country. The great difficulties to be overcome were, the want of traffic to keep the roads open, and the unsuitability of the climate to bullocks and horses. Therefore roads should be made capable of bearing traction engines. An experiment in that direction had been made on the island of Zanzibar, where there was now a road about four miles from the town, through a district which was formerly overgrown with grass 10 feet high, and as full of swamps as the region which Mr. Maples had passed through. On the mission estate, in the island, which consisted of 150 acres, roads had been prepared and metalled, on which a traction engine and waggons were to be seen daily at work. He hoped that before long a similar engine would run on the road which had been so successfully made from Dar-es-Salaam to the interior.

Mr. R. N. Cust said that although the Universities of Oxford and Cambridge sent out the missionaries for higher purposes, their labours had benefited science in many respects. First of all, the geographer profited; after him came the ethnologist; and the philologist followed to pick up any crumbs that fell from the table of the missionaries. They lived among the natives, and acquired a knowledge of their language and customs. There were now translations of the Scriptures and the Prayer Book in languages the very names of which were unknown twelve years ago. All things seemed to be working wonderfully in favour of Africa. Although many who went out had to return through ill-health, and others never returned at all, still the beneficent purpose was being fulfilled of paying back the great debt that was owed to that continent. At the last meeting he had suggested a mode of employing native African travellers. Mr. Saunders objected to the idea, but what Mr. Waller had said about Chuma would show what Africans could do. Why should not natives be trained to do the work which still remained to be done in Africa? They were quite capable of doing it if they were properly instructed and supported.

The CHAIRMAN (Sir Henry Barkly) said it was unnecessary for him to add to the praises which had been already awarded to Mr. Maples for his interesting and able paper. The Society were fully aware of the great services rendered to the cause of geographical exploration by the various Missionary Societies, and it was naturally to be expected that the Universities' Mission, which owed its origin to Livingstone's influence, would take its full share in the work. That it had done so was shown by Mr. Maples, and also by the paper which was read by Mr. Farler eighteen months ago on the Usambara country. In some respects the missionary had greater advantages than ordinary travellers. He could choose his own time for paying a visit, and those under Bishop Steere especially were versed in the native languages. Missionaries, however, might help the cause of scientific geography still more if they were able to take those astronomical and hypsometrical observations which were necessary for fixing the position of places with certainty; and as the Society had by the system of instruction they had recently established at their rooms in Savile Row, facilitated the acquirement of this knowledge, he hoped that some of the gentlemen of the Universities' Mission who had kept up their mathematics, would spare time to qualify themselves for this duty.

Rev. CHAUNCY MAPLES, in conclusion, said that he fully admitted the good qualities of the Yaos, among which tribe were many of his best friends. At the present moment his pockets were filled with letters from them. He thoroughly endorsed what had been said about their activity. It had been his privilege to travel with James Chuma on several occasions, and any expedition which secured his services as leader had good chances of proving successful. The Universities' Mission had for a number of years largely benefited by the willing services rendered by him. In speaking of his journey by land to Nyassa, Bishop Steere said its success was entirely due to Chuma. He had been asked about the temperature of Masasi. In November 1877 the thermometer stood at 98° from nine o'clock in the morning till four o'clock in the afternoon. The average temperature at Masasi was probably 82° or 83°. With regard to the slave trade, he was in a state of uncertainty as to how the slaves were disposed of. When he was at Masasi he once saw a caravan of 500 slaves passing through the district on their way to Machemba's. It was probable that a large number of slaves were taken to the Somali country, and possibly some were taken into the interior to the south of the Zambesi; but he thought there could be no doubt that a great number of slaves were still shipped from Lindi and the sea-coast to the south of that port.

Uganda and the Victoria Lake. By the Rev. C. T. WILSON.

(Read at the Evening Meeting, April 26th, 1880.)

THE country of Uganda is a comparatively narrow strip of land, lying along the north and north-west shores of the Nyanza or Victoria Lake; its southern boundary being the Kagera or Kitangule River, and its eastern the Nile; its northern and western boundaries are not very clearly defined, but may be roughly said to be the first parallel N. lat. on the north, and the thirty-first parallel E. long. on the west. The country may be roughly divided into the coast portion and the interior, the aspect of these two portions being very different. Along the coast of the Nyanza, and for some distance inland, the country is mountainous, especially at the extreme north-western corner of the lake, where ranges of flat-topped hills occur, having swampy valleys between them down which sluggish streams make their way to the Nyanza, their banks being covered with magnificent forest trees with a dense undergrowth of ferns, in which this region is peculiarly rich, I myself having collected upwards of fifty species, and many more no doubt yet remain to be discovered. As we get further into the interior, away from the lake, the country becomes less hilly and the valleys wider, the forests give place to groves of wild date-palms, and the ferns are supplanted by gigantic grasses, till near the northern frontier the country is flat, intersected at intervals by morasses, and covered with scanty jungle, in which the elephant, buffalo, zebra, rhinoceros, wild boar, eland and other antelopes find a home. The coast region is the most fertile and best watered district which I have ever visited in Central Africa, and would be capable of growing almost any European plants and fruits; the few seeds which we succeeded in taking in good condition to Uganda grew very well, and when I left Uganda we had a good crop of peas, cabbages, beans, radishes, onions, &c., in the Mission gardens. Wheat and rice, both of good quality, are grown by the settlers from Zanzibar, while the papai, pomegranate, and guava have been introduced by the Arabs, and bear abundantly. The only native plants or trees at present known to be of any commercial value are a species of nutmeg, which grows abundantly near the lake, coffee, several species of euphorbia, and one or two other trees which produce caoutchouc of good quality, and the mpafu, a large tree which yields a sweet-scented gum-resin much valued by the natives. But there are, probably, many other vegetable products of commercial value yet to be discovered.

The extreme fertility of Uganda is owing to the mild climate which it enjoys, and to the constant showers of rain which fall more or less during every month in the year. There are no scorching days, or dry burning winds, to wither up the vegetation, nor any keen frosty nights to blight the tender shoots. During the whole of my two years' stay on the Victoria Lake, the thermometer never registered more than 90° F. in the shade, and only reached that point on one or two occasions, while on the other hand I have never known the temperature fall lower than 49° F. at night. The rainfall is not very great, as it will probably be found not to be more than 50 inches in a year, but being distributed over the whole year it provides the necessary moisture to support the dense vegetation found in Uganda. The rainiest months in Uganda are September, October, and November, when scarcely a day passes without rain; April is also a rainy month, but in July and August comparatively little rain falls. The rain usually comes in the shape of thunderstorms, which in September, October, and November

cur with remarkable regularity, there being generally three such
orms in the twenty-four hours, lasting about three hours each. These
orms, as far as my observation extends, generally come from the
rth-east, only occasionally from the north-west.

To pass now to the people of Uganda, that is, the Waganda. The
vernment of the country, as it is well known, is an absolute monarchy,
e king however being more or less controlled by the chiefs, who meet
m frequently in council. The country is divided among a few great
reditary chiefs, called Bakungu, who are in constant attendance at
urt, and who rarely leave the king. Under these chiefs are others,
lled Batongoli, who preside over smaller districts, and who in time of
ar are obliged to furnish so many fighting men to their superior, all
e land being held on a kind of feudal tenure. Most of these chiefs
e expected to reside at court for three months in the year, the other
ne months being spent in their respective districts. These Batongoli
e not hereditary, and only hold their position for life, or during the
ng's pleasure. The three leading Bakungu, in the event of the king's
ath, choose his successor, and it is the custom to choose one of the
ungest of the late king's sons, his mother and these three chiefs
ting as regents until the young sovereign attains his majority. In
e case of the three chiefs not agreeing in the choice of a successor,
ey nominate their respective candidates, and then fight till one is
torious, when he places his nominee on the throne. When such a
il war takes place, all the foreigners in the country are taken to one
ce and put under the care of a guard, so as to prevent them from
ing part in any way in the contest.

The present condition of the people is rather more advanced than
was at the time of the visit of Captains Speke and Grant; cloth is
owed to be worn by the people generally, and the Arab costume has
ome the court dress. Mtesa himself has quite abandoned the native
ugu, and generally appears at court in a gorgeous embroidered choga
th fez and red slippers, frequently wearing also a sword; he has a body-
ard armed with guns of various kinds, from old flint-lock muskets to
eech-loading rifles, and dressed in a red and white uniform; these
n have been taught something of drill, by deserters from the
yptian troops at Mruli and elsewhere. Guns are gradually accu-
ulating, and from tolerably reliable information I estimate the number
present in the country at a little over 2000. Other articles of European
nufacture, such as plates, cups, mirrors, knives, &c., have been
ought by the Arabs, and Mtesa himself possesses two or three good
sical boxes. Several of the chiefs can read and write Arabic, while
ne of those who have been under instruction at the Mission learnt to
d Kisuahili in the Roman character in a surprisingly short time.

In other respects, however, the Waganda are just the same as
ey were twenty years ago; there is the same disregard for human

life, and, I fear, nearly as many executions, though not so publicly carried out as formerly. The chief crime thus punished is adultery, both the man and the woman being put to death when discovered. Theft is generally punished by cutting off the hands or ears.

The religious ideas of the Waganda are not of a very high order, though superior to those of many negroes. They have one god, Katonda, i. e. the Creator, of whom they know but little beyond the fact that He made the world and mankind. They have other gods, however, to whom they pray and make offerings, such as the native deities Mukasa, Nenda, and Chiwuka, and they render similar propitiatory homage to the thunder, and the small-pox.

The Waganda seem to have no idea either of a soul or of a future existence.

The language of the Waganda, or Luganda, as they call it themselves, belongs to the Bantu division of African languages; it is an agglutinative language, i. e. the inflections of the verbs, adjectives, &c., are formed by prefixes which are added on to the root of the word one on the top of another. This, of course, makes the language a rather clumsy and ponderous one, words of a large number of syllables being thus formed, and often a single word representing a whole sentence in English.

The Waganda are a promising people from an educational point of view, as far as we can judge; they learn to read very rapidly, and have a very high idea of figures, having native words for all numbers up to thousands.

With such a nation on its banks and with its 2000 miles of coast-line, the Nyanza, or Victoria Lake, must form the great central point on which the future commerce and civilisation of that part of Africa turns; it offers also a fine field to the missionary and the naturalist. The first voyage across the lake was that accomplished by the late Lieutenant Shergold Smith and myself on June 25th and 26th, 1877; but since then I have crossed it from north to south three times, besides coasting along its north-west, west, and south-west shores, from Murchison Bay on the north to Kagei in Usukuma on the south. The north-western corner is filled with an immense cluster of islands, said by the natives to be four hundred in number, which are included in the general term Sesse, though nearly all these islands have separate names. The scenery among these islands is exquisitely beautiful, as they are generally clothed with magnificent trees to the water's edge, the shores being lined with a fringe of papyrus.

I hope that this great Society, under whose auspices and direction this important inland sea was discovered, and which has ever been foremost in aiding plans for the opening up of Central Africa, will not rest till the Victoria Lake and the countries around it have been thoroughly explored and opened up to the merchant, the settler, and the missionary.

Journey to Victoria Nyanza and back, viâ the Nile. By R. W. Felkin.

(Read at the Evening Meeting, April 26, 1880.)

I left England in May, 1878, and arrived in Rubaga, the chief town of Uganda, on the 14th of February, 1879. From Khartum to Lado, the chief town in the Equatorial Provinces, situated on the Upper Nile a few miles below Gondokoro, we travelled by a powerful steamer; but on account of the block in the river, caused by the aquatic vegetation, we made slow progress, and were sixty-seven days on the way.

From Regiaf to Bedden a steamer cannot be used on account of the rapids below Bedden. The journey was made in a day in nuggars, towed from the banks by natives. The scenery on the approach to Bedden is very grand. The river has here a very rapid current; I am inclined to think that if a few of the rocks in mid-stream were blown up a passage might be made, and thus a way would be opened up for a steamer as far as Kerrie, for between Bedden and Kerrie no difficulty presents itself.

The route from Bedden to Kerrie by steamer occupies a good half-day. From Kerrie to Dufli we marched in three days, passing the stations of Mugi, Labore, and Koraio. It would be quite possible to construct a road here, the only difficult part being between Mahatta el Pacha and Dufli, where the road leaves the river and goes over mountain passes for 24 miles, crossing four mountain streams; so that here some blasting and a few small bridges would be required.

We struck the river again at Dufli, and went by steamer in two and a half days to Magungo, on Albert Nyanza. There are two steamers here; one of them, the *Khedive*, is a splendid twin-screw boat, and is a wonderful memorial of the energy and skill of Colonel Gordon, who, surmounting all difficulties, has placed steamers on the Albert Lake.

I may mention in passing that the traveller to Uganda has a choice here of two roads, one viâ Fatiko to Foweira, the other (the way we took) viâ Magungo and Keroto * to Foweira. The former is by far the better one, and I came by it on my return journey. There is one river, the Nyamah, which certainly requires a bridge, but this could easily be built, as there is an abundance of large timber on its banks, and at the spot where I crossed there is an island in mid-stream. This river often causes a day or two's delay in the rainy season, as it rises and falls with remarkable rapidity, becoming quite impassable at times.

At Foweira the Nile (or Somerset, as the river between the lakes is called) is broad and navigable for steamers as far as Urondogani. We travelled in canoes to Mruli in four days, passing Kodj, Rionga's head-quarters. As far as I can ascertain no such lake as that commonly called Ibrahim exists. I was unable to meet with any person who had either seen or heard of the lake. It is possible that at the time of its supposed discovery the Nile had overflowed its banks, and had thus presented the appearance of a lake to the eye of a too credulous observer.

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* The correct position for Keroto is 1° 59′ 54″ N., 31° 57′ 49″ E.

From Mruli to Rubaga we marched in twelve days, but it can be done in nine with comfort. There is only the swamp or river Ergugu to be passed, which is a real difficulty in the rains; in fact at that season most of the road is a vast swamp until we get well into Uganda. Even in Uganda itself the valleys are nearly all swamps. Subsequently I made a journey of about 35 miles to the east of Rubaga, and saw as far as the eye could reach parallel valleys; all that I passed through being swamps at the bottom, many of them having streams flowing through them to the south-east. I think myself that Ergugu is a river, and that it flows into the Kafur, which joins the Nile about half a mile north of Mruli.

Our journey from Suakim to Rubaga occupied 114 days, but the Upper Nile part, from Khartum to Lado, ought to have taken only twenty-one days instead of the sixty-seven it took us, owing to the obstruction in the river; so that we may reckon that under ordinary circumstances the whole distance could be accomplished in sixty-eight days. Mr. Wilson and I have gone into the question of expense, and from very careful calculations, we find that it would cost at the very least 845*l*. for one man to go to Uganda from England viâ Zanzibar with a caravan of sixty men. The Nile route would cost only 332*l*., so that there is a net gain of 513*l*. by this route, in addition to the advantage of avoiding the dangers of the Zanzibar route, and the probable loss of some part of the goods. These figures do not include outfit for the European, nor do they take into account his provisions for any part of the way, save from Suez to Khartum, by the Nile route, but porters for his goods have been included. The organisation of the transport in the Equatorial Provinces is simply perfect.

After a stay of three months in Mtesa's capital, circumstances compelled my return, by the same route I had come, viz. by the Nile. Arriving at Lado, I found that the river was still blocked; to continue the route by water was impossible, and thus we were obliged to take the long and important journey by land, to which I must devote the rest of my paper. There were two ways of going from Lado to Meschera-er-Rek (where we proposed to take steamer down the Bahr el Ghazal to Khartum), one by steamer to Shambil, and then on to Rohl, the other direct viâ Madi, overland. We chose the latter, for at that time of the year a great deal of deep swamp exists between Shambil and Rohl. But when we arrived at Djour Ghattas we found no steamer, and after a month's delay we were advised by Gessi Pacha to finish our journey by land; this was the reason we went round by Dom Suleiman, Darfur, and Kordofan.

We left Lado (lat. 5° 1′ 33″ N., long. 31° 49′ 36″ E., and 1530 feet above sea-level) on September 18th, 1879. The first day's march, to

Wanyetta, was in a southerly direction, and occupied eight hours. The country was partly covered with jungle and partly park land; while the road was infested by lions. Next day we marched five hours, crossing four streams, one of which was called Yunana.

It is very difficult to get at the true names of either villages, mountains, or streams from the people along this route. "Kujar" is the favourite name they give you for everything—it signifies magic. There was little cultivation, the road being through jungle, while very few large trees were to be seen, and the ground was rocky and sandy.

The next march of six hours brought us to Yambara. Thorny bushes and high grass proved a great hindrance; large fields of dhurra and sem-sem surround this place. The men were quite naked; the women wore only a tuft of grass. I noticed that nearly all the women had enlarged bursæ patellæ, probably on account of the very low doorways and the custom of kneeling to most of their work. Many of the men had an enlarged bursa at the elbow.

Fifteen hours more through open jungle brought us to Zanga, a small Government station. Four streams were passed; one of them, El Gelee, must be a large one in the rains, its banks being over 20 feet high, and showing unmistakable signs of often being full. A few palm-trees were to be seen. Six hours' march to the south-east of this place there is a hot spring, much prized by the natives for its medicinal virtues. It bubbles up twice in the day—morning and evening—and a small brook flows from it. The natives both drink the water and bathe in the brook; we brought away a sample of it, but have not yet had it analysed. The women here are quite naked, only wearing a string of beads or an iron chain round the waist, in which a knife is stuck. They are tattooed only on the forehead and temples. Six and a half hours' march over rocky ground brought us to Kadru. Many native graves were seen, all marked by a small stone monument. The huts at Kadru had mud walls, and were painted inside and out with curious pictures of leopards; the spots were black squares, and the tails were as thick as the bodies.

The next march of five and a half hours brought us over mountain passes, 2400 feet above sea-level, to Kederu. Fifteen mountain streams were crossed; the rocks were granite and metamorphic, but chiefly grey granite. We saw a good deal of bamboo on the banks of the streams. Four and a half hours' further march brought us to Madi, the headquarters of the Mudir. After this we reached the River Rodi, which is 200 yards wide at this place. "Rodi" is the word for "river" in the Madi dialect. It was 5 feet deep, and the rate of the current about one and a half knots an hour; it flows to the lake at Shambil, and often overflows its banks. Niyangari is king of the Monbuttu country now.

Five days, or thirty-three hours, brought us to Tyak, a large Government town, with houses built on piles, as so much of the country is under water in the rainy season. The first part of the journey was through splendidly cultivated land; the rest was rolling ground, covered with jungle and much good timber. A large quantity of very good cotton is grown here. The river at Tyak was much flooded, but the apparent water channel was about 50 yards wide, the depth 15 feet, and the current one knot per hour. Thirteen hours' march through cultivated land brought us to Rohl, the chief town of this district. It has a population of about 3000 Arabs and Sudanis, and is surrounded by many native villages. The natives round both Tyak and Rohl have short beards.

After a march of thirty-five hours, which, however, occupied us seven days, we reached Djour Ghattas; having passed on our way the stations of Jua, Mukta, Abreal, Boit, and Tang. Only two rivers of any size were crossed; one after passing Mukta—the Ruha—a swift stream 40 yards wide and 16 feet deep, which we crossed on a V-shaped ambatch raft; and the River Wirded, a short distance from Tang, where there is a native boat at the ferry. This river had overflowed its bank to a distance of one and a quarter mile on the right and less on the left. It was about 10 feet deep, 60 yards broad, and had a current of one and a half knot an hour.

Djour Ghattas is a large place; it is not, as is usual with such settlements, built in an enclosure, but is spread over a considerable area. A good deal has been written about this place, for it was here that Schweinfurth suffered the great loss of his collections and property by a fire which took place. The native population is very mixed, some ten or twelve tribes contributing to it. Large quantities of ironstone are seen nearly all the way between Lado and Djour Ghattas, and a good deal of bamboo was observed on the banks of many streams.

We left Djour Ghattas on the 15th of November, 1879, and in three hours arrived at the station D'rarr. The road is very good; in fact all the roads in the province Bahr el Ghazal could be used for oxen waggons with very little alteration. There is a stream two-thirds of the way between the stations; this used to be the boundary which divided the Bongo from Djour tribe, but the slave-dealers have caused such confusion in these parts, that now no real boundaries exist between the tribes.

The River Djour, which is marked on some maps as the Bahr el Ghazal or Djour, is distant seven hours' march from D'rarr. The ground, as usual, consists of large quantities of ironstone, while many indiarubber and butter trees abound. The native name for these trees is "Lulu." The butter is used by the natives for cooking, and it would, I think, make good machine grease. Mr. Wilson has brought home a sample of it.

The River Djour, which is 200 yards broad here, is very deep, and when we crossed it, the right bank was 30 feet above the water-level, the left bank 15 feet; at high flood the river overflows this bank for two miles from the river bank. A good trench here reminds one of the late war, and it was from this place that the rockets of the Egyptian soldiers set Kutchuk Ali on fire. The war was between the slave-dealers with their chief the rebel Suleiman Bey, and the Egyptian troops under Captain Gessi, now Gessi Pacha; and the country around this place, that is between D'rarr and Dem Suleiman, was the scene of operations.

Another hour's walk brought us to Kutchuk Ali, a place which was before the war surrounded by large gardens and banana groves. These were all destroyed by the rebels, but it is still an important station. The River Waou, with the station Waou on its left bank, is two hours' march distant. Between this place and the river there is a broad plateau 150 or 200 feet higher than either the river or the station. On this plateau there is a curious natural well, not very deep, but with clear and very cold water.

The River Waou, which joins the River Djour some 30 miles lower down, and flows into the Bahr el Ghazal above Meschera-er-Rek, is a swift river, full of crocodiles; the current ran at the rate of about two knots an hour. It is 80 yards broad, the banks 20 feet above the water, and well wooded with large timber. The river gets bank full, but it does not overflow; it is navigable, and will probably prove most useful for small steamers, as it goes far up into the interior. Plenty of plumbago is found in its bed. An hour from Waou we came upon the site of the old station; six hours' further march brought us to Pizilia, which is situated amongst a small semicircular range of hills.

Between Waou and Pizilia there is little to be noticed, save bamboos growing in one place, and two plateaux trending north and south, and elevated about 150 feet above the general level of the country. The country through which the road runs is all open jungle with few large trees. There are two roads between Pizilia and Dem Idris, one viâ Dembo, the large trading depôt of Genau Bey, the other more direct through a dense forest; but this cannot be used in the rainy season on account of the large number of wild beasts which infest the road, and which are only driven from it when the grass is burnt. We went by the latter route, and a march of three days, or twenty-eight hours, through a most glorious forest, brought us to Dem Idris. Thirteen streams were passed, mostly flowing N.N.E.; two rivers also, the Ghittis and the Ji, the latter the most beautiful river I have ever seen. It is, however, full of rocks, and therefore not navigable. It flows into the Bahr el Arab. The country was undulating, but gradually rising all the way. Dem Idris was the scene of several horrible massacres committed by the rebel Suleiman, and the deeds committed here are too atrocious to be mentioned. It was here, too, that the Nyam-nyam soldiers became cannibals, and fed on the victims of the war. They were three months without all other meat, and could not be restrained.

We may, however, hope that the dastardly acts of these Arab slave-dealers are now at an end, and that a good and righteous government will be established; but Europe must see to this, for I heard in Khartum that all Europeans were to be recalled, and without Europeans in the higher posts no good can ever be expected. The quantity of human bones we saw scattered all round the place, and the difficulty of finding a tree unmarked by countless bullets, show how hard the people fought.

Fourteen and a half hours' march from this brought us to Dem Suleiman, the chief town of these provinces. It has been described by previous travellers, and I will confine myself to the remark that it is not one-tenth the size it was said to be. It is fortified by a good wooden stockade, and defended by four cannon and two rocket tubes. The residence of the Governor-General is at this place; it is a well-constructed building of burnt brick, of which material the magazines also are built. The road from Dem Idris is pretty good; fifteen or sixteen small streams are crossed, and two rivers with good ferry-boats. In the gardens, carrots, green peas, sweet potatoes, bananas, pumpkins, lettuce, cauliflowers, radishes, as well as other Arab vegetables, are to be found. Rice, too, can be procured near here, and wild rice with a very large grain grows near the rivers. The country is now perfectly quiet, and the people, Gessi Pacha says, are beginning to understand the great good the late war has done them in freeing them from the slave-dealers' rule.

We left Dem Suleiman on the 4th of December with a strong escort, as Gessi Pacha did not consider the road quite secure. From here to Liffi is twenty-four hours' march; it occupied us four days. Soon after leaving Dem Suleiman, the swift River Biri is crossed by a good ferry-boat, and two hours more brought us to Gebel Doleb, so called from the large number of palm-trees near here; crossing this belt of palm-trees took up five hours. Only two important rivers are crossed, the Sabu and Lugu, both impassable in the rains, and the irregular ground between these two rivers is full of water at that season. Some seven miles from Liffi, Gebel Liffi is seen on the right, and a curious cone-shaped rock, about 150 feet high. On the left, near the road, Gebels Kagola and Ndandu, and, in the distance, the Nambusa and Nasheka Hills form a pleasing view. Nearly all the huts here are built with good mud walls; the natives are, many of them, armed with bows and arrows, and mostly belong to the Uru tribe. The tribes north of Liffi are the Togoi and Luderi. Mount Delgonna lies one and a half day's march north-east from here. The River Liffi is a good broad stream, over 100 yards wide; it has a sandy bottom, and it often overflows its banks for miles. The mornings were very cold, the thermometer indicating 57° to 60° Fahrenheit.

The next Government station, Foroga, is distant twenty-two hours, or three days' march from Liffi. Gebel Gondu is the only object of interest on this march; it is six hours' walk from Liffi, and is a rock some 350 feet in height. Only one narrow path leads up to its summit, where a village has been built. The ground is rocky, and a little ironstone is seen. The natives had never seen a European before, and were much surprised and pleased. Open jungle with small trees is the rule here.

From Foroga to the Bahr el Arab we marched twenty-three hours in four and a quarter days. There was very little water to be got on the road, and the men at Foroga, who by the way are all dressed in long-cloth shirts, do not carry loads well. Until within a short distance of the river, the road throughout the whole length runs through an extensive forest, which is full of large game of all sorts. Here we saw the true tsetse fly, owing to which no cattle can live here, although to the north of the river large herds are kept.

A day and a half's march from Foroga a splendid range of mountains is met with, running nearly east and west, but the road is never more than 2500 feet above sea-level, passing through a mountain gorge. Just before El Brak there are some curious underground caves, evidently of volcanic origin; these serve as wells, and contain very good and cold water. There was very little water in the Bahr el Arab; the stream is 120 yards broad; the banks, which it overflows, are only 15 feet high, and the country for miles each side is one vast swamp in the rains.

From the Bahr el Arab to Kalaka, a small station, is thirteen hours' march. Here we had oxen to transport our goods. The people are Arabs. Our march to Dara was slower than usual, as we took six days to walk twenty-five hours. This was partly accounted for by the difficulty of getting water. A good deal of the land we passed was cultivated; it was rolling ground, gradually rising up to 1930 feet above sea-level.

From Dara to Khartum we travelled on camels, passing Tuascha Omarschangar, Charlotta (where we saw the telegraph for the first time), and Obeid. We crossed the Nile a few miles north of Abu Kurat, three days from Khartum.

Recent Volcanic Eruption at the Grand Souffriere, in the Island of Dominica.

THE President of Dominica, Mr. Eldridge, has reported to the Colonial Secretary the rare occurrence of an eruption of volcanic ash from one of the dormant volcanic vents in the interior of that mountainous and rugged island. It took place on the 4th of January last. He says:—"The morning was cloudy, with heavy and continuous showers. A few minutes past eleven o'clock in the forenoon, and during a heavy rainfall, one or two vivid flashes of red lightning were observed; thunder was heard, but not following in quick succession the electric discharges; it was deep-toned, rolling, and distant. All at once there was a great darkness. A few minutes before the darkness, the attention of many persons was attracted to the milk-white appearance of the rain, which was succeeded by a downfall of inky blackness. This singular phenomenon lasted some fifteen minutes, and on the return of the light it was discovered that the ground was covered with the scoriæ from a volcano. The rainfall was highly charged with lead. The occurrence caused much consternation amongst the people. The deposit was very local, passing over the town of Roseau, and spreading but a short distance on either side, but it has been traced inland in a direction leading to the Boiling Lake."

The following further details, supplied to the President by Mr. G. B. Blanc, C.E., the Surveyor-General of the island, will be found interesting:—

> The morning of Sunday, the 4th January, 1880, was showery up to about 9 A.M., at which hour the rain began to fall more steadily, increasing in volume until after ten o'clock, when it became very heavy, with occasional flashes of lightning and deep-rolling but distant thunder. About 11 A.M. the sky became darkened as in a partial eclipse of the sun, with a strange heavy feel in the atmosphere; there was just previous to this a deep, muffled sound. On looking out, I observed that the rain was thick and of a greyish white hue, and the gutters were running with water almost as white as milk. The sky was dark and sombre, with a murkier darkness than is seen in a partial eclipse. I immediately caught some of the water in a glass, and in about a minute it commenced to deposit a grey powder, and in five minutes had finished depositing, leaving the water of the colour and consistence of watered milk. The flashes of lightning became at this time more frequent and vivid, and the thunder deeper and longer in the roll, but still distant, judging from the intervals between flash and sound. The rain continued to pour in torrents, but the sky gradually cleared, and about noon there was an apparent unnatural brightness, but whether this was actually the case, or was not rather the effect of the reaction upon the eyesight from the previous gloom, assisted by the glare from the bright glistening sand which by this time lay thick upon the pavement, I could not satisfy myself. The Roseau River rose higher than I have seen it since I came here in September 1861, touching the planking on the iron girders on both the bridges, being 14½ feet at the Bath and 12 feet in Roseau above usual level. On Tuesday I received a report that the Point Mulatre River, the head-waters of the northern branch of which issue from the Boiling Lake and the adjacent springs in the sulphur beds around it, was completely filled up with the same kind of sand as that which fell in Roseau, and later reports confirm this. The northern branch has for the time being disappeared, and the water with difficulty forces itself as a small rivulet along the top of the débris in the lower or main channel which is supplied by the southern branch of this river.
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> At the time of the eruption, the wind was blowing from the south-east, and although it was not apparent in Roseau, it must have been strong on the mountains, as the deposit of sand was partial and wholly on a line due north-west of the Souffriere Mountain, never having fallen at Point Michel village, to the south, nor at Canefield to the north of Roseau, both distant in a direct line about one and a half mile, but a vessel at sea about five miles from land, to the west of the town, had a thick deposit on her decks. This locality of the eruption is 2500 feet above the sea.

Since the 4th, the mountain has been covered with dense mist, but last night's heavy gale appears to have dispersed it, and this morning the people at Laudat, a settlement on the slope of the Cold Lake Mountain, and lying on the head-waters of the northern branch of the Roseau River, observed that the ridge which divides the watershed of the central branches of the Roseau River from the northern branch of the Point Mulatre River had almost disappeared, and that the trees on the spurs of the mountain reaching nearly to the northern branch of the Roseau River and away south towards the slopes of Morne Anglais were completely blasted and burnt. I sent a party of experienced woodmen to ascertain the extent of the country destroyed, and they reported that after passing the middle branch of the head-waters of the Roseau River, the path on to the Mineral Ravine and thence over the ridge to the valley of the geysers was completely obliterated; not only so, but all the trees (and many were lofty timber trees) had disappeared; the land is a bare, rugged surface of torn-up earth. They were obliged to follow the middle branch up, wading knee-deep in the soft, sandy ash thrown out by the convulsion, which extended half-way to Laudat. On reaching the top of a spur of the Grand Souffriere Mountain, they found all below them one large denuded basin of, so to say, boiling earth. From the ridge, which had considerably fallen in height, away to the east as far as the deep valley of the Point Mulatre below the Boiling Lake, was a bare, barren mass of débris; not, they say, a standing tree or leaf to be seen; the wooded ridge between the Geyser Valley and at the site of the Boiling Lake two large columns of steam and boiling water were all that was to be seen. Whether the lake as a lake existed or not they could not tell, as they did not get within a mile of it.

The deep valley lying near the Boiling Lake is reached by a precipitous descent of about 600 feet from the ridge which divides the watersheds of the Roseau and Point Mulatre rivers. It is thickly studded with small, active geysers, throwing up clouds of steam and small jets of boiling water, each surrounded by a ring of sulphur and alum crystals, some of them very beautiful. The valley at its upper end is like a huge bowl, with a small section on one side broken away, through which a considerable stream of water finds an exit to the Point Mulatre River. I do not doubt it formed in ancient times the crater of a volcano. About half a mile down, the valley is divided by a low wooded ridge from the bare plain above alluded to, from which plain issues a strong stream of boiling hot water. This plain is also thickly studded with small geysers, but not so active as those in the valley; its surface is covered with rough sulphur ore, a species of pumice-stone, and a shining, sandy mud, evidently of the same nature as that which fell in Roseau on the 4th January. The plain is of some 25 acres in extent, and from its eastern edge and that of the lake, the land falls in impracticable precipices down into the Point Mulatre valley hundreds of feet below.

The head-water of the Roseau River, which rises or issues from the ridge before referred to, is called Mineral Ravine; it has, in parts, distinct traces of recent volcanic action on its banks, and its waters have in many places a strong smell of sulphur. It is doubtless to it that the Roseau River owes its milky appearance since the eruption, which it still retains. The deluges of rain we have had probably drowned the geysers in the valley and plain mentioned, and choking the subterranean fissures connected therewith, the resulting steam and pent-up internal forces caused, without reasonable doubt, the violent eruption I have attempted to describe. I shall not be surprised to hear that the Boiling Lake has in the convulsion burst the narrow dam which divided it from the deep valley below, and has disappeared as a lake, forming a bowl-like hollow on the mountain side, similar to the upper end of the adjacent valley.

There are in the island several other sulphur springs, but no extra action has been observed at any of these localities, so that the cause of the eruption by the Boiling Lake must have been local, which accounts for no subterranean motion or noise beyond that of the explosion being felt or heard. The Boiling Lake was visited for the first time, in this generation, five years ago; but its existence was known of a century previously, as it is referred to in a work by one Dr. Clarke, F.R.S., dated 1777.

GEOGRAPHICAL NOTES.

The Envoys from King Mtesa.—The three Uganda envoys, Namkaddi, Kataruba, and Sawaddu, had an audience of Her Majesty the Queen, on the 14th inst., at Buckingham Palace, and presented the letter from their king with which they were entrusted. The Rev. C. T. Wilson and Mr. R. W. Felkin of the Uganda Mission, and Mr. Edward Hutchinson, Secretary of the Church Missionary Society, were introduced at the same time.

The Baptist Missionary Expedition on the Congo.—The Rev. T. J. Comber, whose arrival at San Salvador was reported in our issue for last October (vol. i., p. 666), has sent home to the Baptist Missionary Society a report of his proceedings to the close of last year. He had made a journey to Makuta, but had unfortunately met with a rebuff there. Mr. Comber makes a few remarks about the climate of Congo, from which it seems that the party have been but little troubled with fever, and that their health has not suffered to any serious extent, though their "susceptibility to colds and slight fevers has been specially noticeable with the change of seasons, as it is usually with old residents in Africa." Mr. Comber calls attention to the great difference in the general aspect of the country at different seasons. In July the hills were all covered with brown grass from five to ten feet high, while early in October this had been burned and the hills were all bare and black; in November, again, they were covered with small green grass. In the middle of December the little River Luegi, in the valley, had risen over ten feet with a month's rain, overflowed its banks, and spread over the valley to a considerable extent. With regard to his plans for getting further into the interior, Mr. Comber says that when they were refused the road at Makuta, he at first contemplated an immediate journey to Zombo, in spite of the rainy season. On mature consideration, however, he resolved, rather than risk an abortive attempt, to remain at San Salvador during the three months' rains, and to let reports of what they were doing there spread about so as to induce confidence on the part of the people. He has since succeeded, he thinks, in securing a route to Stanley Pool, viâ Sanda, about two days' journey distant from Makuta, where he and his colleague Mr. Crudgington have met with a very kind reception.

atitude and Longitude of Places in Central South Africa.—We have red, through Sir Bartle Frere, the following list of latitudes, taken ather A. H. Law, accompanied by some remarks by Mr. A. C. Bailie, rnment Land-Surveyor at the Cape of Good Hope :—

Place.	Lat. South.			Remarks.
	°	′	″	
ntein between Zee- and Marico River	25	9	0	
road joins Marico er	24	36	0	
efore Marico River s a large bend ..	24	21	0	
n near junction of ico and Limpopo ..	24	12	0	274 feet above sea-level. This must be at the rivers, as there is no other water on the road.
e Kol Tree	24	8	0	By Baines, 24° 6′.
e Junction	23	45	0	
Draai	23	40	0	Road leaves Limpopo River, and strikes for Shoshong, 2418 feet.
Vley	23	36	30	
reeds	23	32	0	Water at a few feet through peat.
t north-west corner arge Pan	23	21	0	
ong	23	1	0	Capital of Bamangwato, 3475 feet.
apsi River	22	58	0	
i River	22	51	0	
nie Vleys	22	46	0	
he Pans	22	32	0	
River	22	3	0	Near this the first baobab tree is found (about 1 mile off).
si „	21	51	0	
„	21	33	30	
„ (south bank)	21	28	0	Old gold diggings—Quartz Reef.
erau River	21	15	0	
wo „	21	6	0	
ie's „	20	57	0	Called by Amandek "Kiresinyamaois," the place where strangers are stopped until their arrival has been reported to the king. Maswe is the Induna.
Castle	20	33	0	
uwayô	20	16	0	By moon's meridian altitude.

he longitude of Gubuluwayo is given by Father Law as 28° 44′ 26″ king the mean of four results). On this Mr. Bailie remarks:— accurate determination of the longitude of Gubuluwayo is im- nt. In Stanford's map it is marked 29° E. By my dead reckon- make it 28° 50′, while F. Weld from the same data made it 27° 50′. nk his computation is wrong. My latitude of Gubuluwayo was 5′ 30″, but as my horizon was only linseed oil in a tin saucer, I lways been suspicious of the result. Father Law is an experienced areful observer."

r. F. C. Selous's Explorations in South Central Africa.—Mr. Selous, Sir Bartle Frere speaks of as a well-known traveller and a hunter at determination and experience, has recently communicated to us, gh Sir Bartle, the results of his chief explorations in the remoter parts of Central South Africa. One of his journeys was along the seldom-visited northern bank of the Zambesi, from a point about 80 miles east of the Victoria Falls to the junction of the Kafue, or Kafukwe River, at which place he struck for the interior in a northerly direction, climbing the mountains and traversing the plateau of Manica, finally reaching the swamps of the River Lukanga. He was then about 120 miles distant from Lake Bangweolo, which the illness of his companion, Mr. Owen, prevented him from reaching. This journey was performed in 1877-78. In 1879 he visited the district of the Botletle River and its northerly tributaries, and made a study of the curious problem in fluvial hydrography presented by these and the neighbouring streams; arriving at the conclusion that they are governed in the rise and fall of their waters by the Chobe. The two papers sent to us by Mr. Selous, giving details of these journeys and observations, accompanied by rough though useful maps, will be published in an early number of the 'Proceedings.'

A Journey in Damara-land, and beyond the Okavango in South-Western Africa.—We are informed by Sir Bartle Frere, that Mr. Louis Thomas, of Boston, in the United States, has for about five years been engaged in trading and travelling in Damara-land, in the neighbourhood and to the east of Lake Ngami, and northwards as far as a point which he places between the Okavango and Cunene rivers, in about 14° 40′ S. lat. and 15° 15′ E. long., and that he has found our existing maps of the country beyond Damara-land very defective and erroneous. Sir Bartle has kindly forwarded to the Society a translation of a narrative of this journey, published in 'Het Volksblad,' a Dutch newspaper, but the notes made on these little-known countries by Mr. Thomas and his elder brother, who was killed by an Ovampo tribe on the Okavango River in the middle of 1878, have been sent to their family at Boston, and will no doubt be published on the return of the surviving brother to the United States. It may be of interest to add that Mr. Thomas informed Sir Bartle Frere that Portuguese traders from the West Coast not unfrequently cross the continent to the East Coast, and that he met one, named Pendava, on the way from Mossamedes to the East Coast with a very large number of native bearers.

The Establishment of Polar Stations for Scientific Observations.—As the outcome of the International Polar Conference at Hamburg in October last, arrangements are being made, or are under consideration, for the establishment by various nationalities of stations for scientific observations in different parts of the polar regions. The Dutch will probably occupy Spitzbergen, as the Swedish Government is unwilling to ask for a vote of money for a station there; the Danish Government have provided the necessary means for the establishment of a station at Upernavik; in Russia sufficient money has been raised to provide for two stations at the mouths of the Lena and in Eastern Siberia (see p. 388); in the United States the meteorological department have been directed to establish a station at Point Barrow; while as regards Austria, Count Wilczek, who, in conjunction with Lieutenant Weyprecht, originated the movement, has undertaken himself to provide the funds necessary for the organisation of a station in Novaya Zemlya, which will be in charge of Lieutenant Weyprecht. It is probable that Canada will also take part in the movement, and the German Government is said to look favourably on a plan for a station in East Greenland.

Mr. Whymper's Mountain Ascents in Ecuador.—Mr. E. Whymper, according to letters recently received by his friends, had, by March 28th last, succeeded in climbing, besides Chimborazo, the great Andean peaks Corazon, Sincholegua, Antisana, and Pichincha, and in spending twenty-six consecutive hours on the top of the volcano Cotopaxi at the height of 19,500 feet. Mr. W. H. Johnson, in 1865, attained in the Himalayas the height of 22,300 feet, and is said to have slept at nearly 22,000 feet above the sea-level,* so that Mr. Whymper has not quite equalled the highest ever attained; but the result of his experience as to the gradual self-adaptation of the human frame to high altitudes will probably encourage Alpine clubmen to attempt to push still further. Mr. E. Whymper has taken numerous observations for the determination of heights and collected other data. The results of his journey will be published on his return to England, which is expected in the course of the present month.

Affluents of the River Purûs. — The South American Missionary Society have received intelligence that Messrs. Resyek Polak and McCaul, who are stationed at São Pedro de Caxoeira, on the Rio Purûs, are about to undertake an expedition to some of the unknown affluents of the river. Mr. Polak has peculiar qualifications for his task, owing to his familiarity with the language of the Hypurina Indians, who will be encountered during the expedition. In a recent examination of the neighbourhood of their settlement, the agents of the Society have succeeded in penetrating the dense forest for some distance to the eastward, and have been fortunate enough to discover a lake abounding with good fish; they also have reason to think that there is another lake in the same direction, which they have not yet been able to reach. It is further interesting to learn that they hope soon to be able to send home a copy of a new chart which they have made of a part of the course of the Rio Purûs.

Colonisation in the South Seas.—Some little time back, the Marquis de Rays, Bolivian Chargé d'Affaires at Paris, conceived the idea of forming a new colony in the South Seas, and from the Australian papers just received we have intelligence respecting the first vessel sent out in connection with this project. We learn that no expense has been spared to make the enterprise successful, and that the ship in question, the *Chandernagore*, took out machinery for distilling, for sugar-refining or seed-crushing, and for saw-mills; also a steam crane, agricultural implements, a quantity of bricks, and numerous other articles, including provisions for a year. The first party consisted of eighty-two men from Germany, France, Belgium, Switzerland, and Italy, and were in charge of an American named McLaughlin. On January 5th, the *Chandernagore* landed eighteen of the party at the island of Langlan in the South Seas, and shortly afterwards proceeded to New Ireland, anchoring in Likiliki Bay, 240 miles from Langlan. The remainder of the colonists landed here, and were received with apparent good-will and friendliness by the natives, of whom there are estimated to be about 150. The island is described as hilly and very picturesque.—The Marquis de Rays has also fitted up two steamers, one of which left Barcelona for New Ireland on January 26th with 750 Spaniards on board, and the other is to follow shortly; taking out in all probability the originator of the enterprise.

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* 'R. G. S. Proceedings,' vol. xix. p. 363.

The Sanpo of Tibet.—In the last Indian Survey Report (for 1878–79), an interesting account is given of the journey of L——, a native explorer, who surveyed nearly five years ago a portion of the Sanpo River which was previously quite unknown. The traveller started from Darjiling, in March 1875, and proceeding through Independent Sikkim,* crossed the Great Himalayas by the Kangra-lama La or Pass, beyond which is Ganpa Jong, a fort where the party were stopped, but allowed to proceed a short way under guard the next day. However, it was not till the fifteenth day that they were finally released and permitted to pursue their way unmolested towards Shigatze, where they arrived about the middle of May. Here the explorer was re-examined by the Governor, and not allowed to depart till the arrival of some traders whom he persuaded to vouch for him. While he was in Shigatze, the greatest consternation among the inhabitants was caused by the report that the Lieutenant-Governor of Bengal and Commissioner of Darjiling were in Sikkim. Detachments of troops were immediately sent off to guard the Sikkim passes, and thirteen companies of Tibetan soldiers (about 350 men in all) marched in from Lhassa to garrison Shigatze. These men were armed with swords, and a gun to every two men. The monastery of Tashilumbo adjoins the bazaar of Shigatze, and contains 3800 monks. Notwithstanding the excellence of the road between Shigatze and Darjiling viâ Ganpa

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* This part of the explorer's work admits of being checked by that of Dr. Hooker, who carried a survey up to the same pass. The two surveys are said to agree very fairly.

Jong, there is very little traffic owing to the exclusive policy of the Chinese, and during the fifteen days the explorer was detained near Ganpa Jong, not a single merchant passed. L—— crossed the Paina Chu River, a stream alive with large fish, by a bridge 80 paces in length, of large wooden beams resting on four large piers, and then following the course of the stream to its junction with the Sanpo, traced the latter river for a distance of 50 miles eastward, a section which had not been explored before. The mean width could not well be determined, as in some places the river flows in several channels, and in others spreads out into a great expanse of water with a hardly perceptible current. Villages are frequent along both banks, and extensive cultivation is seen inland. There is boat traffic between Shigatze and Jagsa, where the road turns off and runs south-east to Yasi, on the margin of the Yamdok-cho or famous "ring-shaped lake." Between Shigatze and Yasi there is considerable traffic; the explorer met or passed three or four hundred men with loads every day, and he travelled for hree days with some thirty Nepalese merchants on their way to Lhassa with cloth and brass, while he met some Kashmiris returning thence with brick tea. The Yamdok-cho Lake, according to the explorer's ccount, is *not* a ring lake after all, though it has prominently figured s such on every map of Tibet since D'Anville's time. He was informed hat yaks and sheep which he saw grazing on the mountains on the upposed island had got there without crossing water, by a path leading long a neck of land from the south. Having crossed the Khamba La ass, L—— traced another hitherto unsurveyed section of the Sanpo rom the Chak-jame-churi iron bridge (leading to Lhassa) to Chetang, assing on his way villages and monasteries. These last he always took are to make the circuit of on foot, and hat in hand, in the orthodox Tibetan fashion; but he saw some whose superior piety led them to make the round on their knees, and even laying themselves flat on the ground.

At Chetang he could see the Sanpo trending away to the horizon east by north in a wide valley, the view being bounded by a snowy range a great way off. The road continues along the right bank of the Sanpo past Chetang, but L—— was warned against going along it, unless he accompanied a strong body of merchants, for it is beset by thieves and wild and turbulent tribes armed with bows and arrows to be met with near Chari. Accordingly, after remaining in Chetang six days, L——, thinking he might run short of funds, left about the middle of December 1875, and turned southwards, intending to follow the route of Nain Sing into Assam. He appears, however, to have taken an alternative route from Chetang to Tangshokh (Tangshu), though from thence to Tawang the routes of the two coincided. At the latter place, the party were taken before the authorities, who peremptorily refused them permission to proceed, and imprisoned them in the public flour-mill.

There were 300 traders who were detained at the same time, while two young men who spoke their mind too freely on the subject of such arbitrary detention, were promptly locked up, and their goods impounded and sold. At length three mounted soldiers were told off to escort these two men and L—— to Lhassa. Fortunately, however, before they got to Lhassa the governor of a fort on the road objected to some informality in the document carried by the soldiers, and ordered them back to Tawang, informing the travellers at the same time that they were free to depart. L—— made his way back to Shigatze, suffering much from the extreme cold on the way. About the end of March 1876 he completed his arrangements at Shigatze, and finally returned to Darjiling by the route followed by Captain Turner in 1783. At Phari, where there are three Chinese officials and thirty mounted soldiers, he was detained for a month, but eventually released through the intervention of one of the leading men of the village. He then descended the valley of the Ammochu past Chumbi, the summer residence of the Sikkim Raja, and reached the Jiliph La Pass, whence the road is fairly level for 15 miles, and then exceedingly steep and difficult for 9 miles, being the hardest bit the explorer had passed over since he left India. From Shigatze to this descent the road is extremely easy, presenting absolutely no physical difficulties, but on portions of it north of Phari fodder for baggage animals is scarce. L——'s absence from India extended over a period of one year and four months.

Meteorological Phenomena in China.—In his last Consular Report from Shanghai, Mr. Arthur Davenport calls attention to a singular fact which appears worthy of record here. As is well known, the northern provinces of China have recently suffered severely from famine, and Southern China has at the same time been equally afflicted by floods, caused by an excessive rainfall, while the valley of the Yang-tsze, which forms the intervening belt between these two great tracts of country, has been devastated by visitations of locusts. This belt lies between the 30th and 31st parallels of north latitude, and as it is clearly defined, it would be natural to expect certain meteorological phenomena directly in relation with the want of rain on the one hand, and its extraordinary abundance on the other. Under these circumstances, Mr. Davenport remarks, it is not surprising to learn that the Jesuit fathers in charge of the Observatory at Sic-ca-wei, in the neighbourhood of Shanghai, have noticed during the past years in the upper regions of the atmosphere a constant aerial current of great depth, flowing in a direction almost parallel to the general line from east to west followed by the Yang-tsze during its course through China. This current was rendered plainly visible by the numerous cumuli and cirri which were perpetually carried in its course. The northern provinces of China, having no great lakes in their midst, derive their rain-supply for the most part from the amount of moisture which can be brought from the tropics in aerial currents; and during the past years it would seem that this gigantic current flowing from east to west has, by its enormous depth, breadth, and rapidity, formed an insuperable barrier to every secondary current attempting to pass from south to north, or from north to south, at a certain elevation from the ground. This current at length disappeared in July last year, the cirri in the higher atmosphere having no longer any fixed direction, and travelling with comparative slowness, whereby rain-charged clouds were again enabled to pass freely to the north.

Northern and Eastern Somâli-land.—A Report addressed to General Stone-Pasha, Chief of the Egyptian Staff, by Colonel Graves-Bey on the subject of his mission to Cape Guardafui, affords much information in regard to the country of the Mijjertain Somâlis. The Somâli race occupy the region from Cape Guardafui to the shores of the Red Sea, and on the south as far as N. lat. 7°. A line drawn from Tadjura southwards and a little to the west as far as the seventh parallel and following it to the Indian Ocean will approximately define their territory. They are divided into four principal families, named Mijjertain, Ursangalli, Ishack, and Issa. The most numerous of these, and at the same time the most uncivilised, are the Mijjertains, who occupy the country from Ziadeh on the northern coast to Cape Guardafui and the southern boundary of Somâli-land; the other families lie to the westward of the Mijjertains in the order given above. The country of the Mijjertains consists, for the most part, of an elevated plateau, rocky and stony, intersected by deep and narrow valleys, and divided into steps or terraces varying in height from 1000 feet to 5000 feet above the sea-level. The appearance of the country, as seen from the heights on the coast, is very striking, and exhibits a succession of mountainous ranges, the summits of which present themselves to the eye in horizontal lines, and rarely, if ever, in peaks. The geological formation near the coast is generally calcareous, with some sandstone and occasionally volcanic rocks; in certain places a rose-coloured rock is seen, which is susceptible of a high polish, and is apparently of marine origin. The surface of the country is sterile and rocky; the soil is stony and of little depth, and produces nothing but shrubs, climbing plants, and thick, tufted grass. In the valleys the trees are taller, and on the lofty mountains towards the northern coast are found magnificent incense trees, some of which are two or three feet in diameter. The poison tree, from the roots of which the natives extract a black and pitchy substance for poisoning their arrows, is common throughout the country, and generally grows on the edges of ravines.

Everywhere there are traces of a heavy rainfall during the rainy season, about the period of which the statements of the natives are contradictory, but it would seem that it corresponds almost with that of the north-east monsoon, and that the dry season corresponds with that of the south-east monsoon. The heaviest rains are at the end of winter and the beginning of spring. The temperature in May and June is between 85° and 95° F., rising to 105° or 108° with the strong southerly winds.

The Mijjertains claim to be descended from a fanatical Arab, named Darot, or Tah-roud, who was expelled from his own country in the reign of El Hajag Ebn Yussuf (in the years from 75 to 95 of the Hegira), and derive their name from his great-grandson. Like all the Somâlis, they are handsome in appearance, perhaps a little too thin, with small and delicate hands and feet; they have well-formed heads, oval faces, thin lips, and open nostrils. Their eyes are bright and intelligent; their skin is black, with a reddish tint in it, the colour being very different from the blue-black of the negro; and their hair is woolly. With these exceptions, they are as far removed from the negro type as the best types of the white race. The young men wear their hair long, mixing it with a paste made of mud and lime, which gets rid of the woolly appearance, and leaves the hair in long curls; the older men, on the other hand, shave their heads. The women wear long petticoats of soft leather, or of coloured calico, and a piece of calico thrown diagonally over their shoulders. A blue handkerchief on the head indicates a married woman, while the girls wear their hair in small ringlets shining with butter, and ornamented with strings of white and red pearls. The men are in the habit of wearing round their necks a piece of leather, to which are fastened two pieces of amber, each as large as a hen's egg.

The Mijjertains are described as having the appearance of being always in fear of their neighbours. The men never go out without arms, every one carrying a javelin and a spear, and sometimes a short two-edged sword, though for the last a heavy cudgel is commonly substituted. The spear has a barbed head, and they throw it with extraordinary force and skill to a distance of about 25 yards. After it is once buried in the body of an enemy, it is impossible to extract it from the wound without tearing the flesh in a frightful manner. A bow and poisoned arrows very often take the place of the spear.

Almost the only occupation of the people is the tending of their flocks, but a few of them are employed in collecting incense and other kinds of gum; in the villages there are a few traders and shark-catchers. Agriculture is totally unknown, and excepting in a small garden at Wady Fahmme, cultivated by an Arab, no vegetables or fruits are to be met with. Colonel Graves was further informed that no grain of any kind would be found throughout the whole country, a state of things which he attributes to laziness and pride, the men considering manual labour a degradation. The women, however, are hard-working, and nearly all that is done in the country is done by them. The only industries are the weaving of mats, chiefly for export, and the manufacture of spear-heads, the latter being the occupation of a small number of men in each tribe.

At the present time the Mijjertains are divided into about thirty tribes, each of which has its own chief and its own *cadi;* all recognise the sovereignty of Osman Mohamed Yussuf, who bears the title of *Boghor*, or Sultan. The population is divided into villagers, semi-nomads, and nomads. The first live in the nineteen or twenty villages which are found on the coast, and include the traders, the collectors of gums, and the shark-catchers. The semi-nomads also live in the villages or in their neighbourhood, but being the owners of camels, sheep, and goats, are obliged to move about in search of pasturage. They frequent the coast between September and March, and go to the mountains at the approach of the south-west monsoon. The true nomads seldom visit the coast, and remain there but a few days, for the purpose of exchanging their sheep, butter, skins and gums, for calico, rice, dates, maize, glass-ware, and iron. In the interior there are neither towns nor villages. The coast villages contain about 38,000 inhabitants, including the semi-nomads, who are more numerous than the true villagers in the proportion of six or eight to one. The nomad population inhabiting the plateaux in the north is estimated to reach about the same figure. In the mountains towards the south and south-west boundaries, on both sides of the Wady Nogal, are found eleven tribes which never visit the coast, and have very little intercourse with the other Mijjertain tribes. These bring the total population of the country up to rather more than 105,000.

Alluleh, on the northern coast, about 30 miles west of Cape Guardafui, is the most important of the villages; it contains several houses built of stone and about 350 huts, scattered about a narrow tongue of land lying between the sea and a small bay, which forms the only safe anchorage all the year round for the small vessels which visit the Mijjertain coast. Mareyeh, lying further to the west, is also an important village, from which there is a large export of myrrh and incense. Colonel Graves says he could find no trace of the five forts which are supposed to guard this place. The Sultan, now a young man of nineteen, lives at Mareyeh for two or three months in the year, and apparently he spends the rest of the year in going about the country to collect tribute. The greater part of his wealth and that of his subjects is derived from the pillage of vessels wrecked on the coast; indeed, Colonel Graves says that at the time of his visit there was not a hut within a radius of 75 miles from Cape Guardafui which did not contain some article stolen from one of the ships lost during the previous year.

A Supposed recent Survivor of Leichhardt's Expedition.—About the beginning of 1848 Dr. Ludwig Leichhardt, it will be remembered, made his final start on his great journey of exploration across Central Australia from south to north. On the 3rd of April in that year he despatched a letter to Captain P. King, R.N., from the Cagoon,[*] but after that no certain intelligence of his movements or of the fate of his expedition ever reached the outer world. In addition to incidental attempts to unravel the mystery, two principal expeditions were sent to search for the remains of the party, and to discover their route in the interior. One[†] of these was organised by the ladies of Victoria, at the instance of Dr. F. von Müller, and aided by donations from the Queen and our Society, and was led by Mr. Duncan McIntyre, who died of fever on June 4th, 1866; while the other was sent by the Government of Western Australia in 1869, under Mr. John Forrest, whose report was published in our 'Journal' (vol. xl. p. 231). Though both these journeys added something to our knowledge of the interior, they did not do much towards the accomplishment of the main object for which they were undertaken. Various reports have from time to time been current of the existence of a survivor of the expedition among the blacks of the interior, and the most extraordinary of these was the statement of Andrew Hume, a prisoner in Paramatta Gaol. Some six years ago Hume affirmed that he had met Classen, a survivor of Leichhardt's expedition, who was detained by a native tribe. At the instance of our associate, Mr. Eccleston Du Faur, and others at Sydney, Hume was sent to search for the supposed Classen, but he unfortunately died during the journey, and doubts have—perhaps not unnaturally—been entertained of the truth of his assertions. Mr. Du Faur, however, has quite recently received from a friend a memorandum of particulars corroborating Hume's statements, which he had obtained from Messrs. J. R. and H. Skuthorpe, who have long been engaged in exploration in the far west of Queensland, and are said never to have seen any connected account of the statements made by Hume and published in the Australian newspapers. The memorandum in question is too long for insertion, but in order that a record of it may be preserved, we give the following *résumé* of its contents:—

About a month before Hume's death, Mr. J. R. Skuthorpe, then on his way to the Diamantina, met this man on the New South Wales border, and spent a night with him. Though reticent about the errand on which he had been sent, Hume gave evidence of his acquaintance with the distant interior by the correct information he furnished Mr. Skuthorpe respecting the country he wanted to explore, and by his description of regions he had already visited. After Messrs. Skuthorpe had spent some time on the Diamantina, some blacks informed them that a long way further west there was a very aged white man, whom they had seen on their way to obtain the intoxicating herb *pitcherie*, which, so far as is at present known, grows only on one creek, and that about

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[*] Cf. Captain W. H. Smyth's Presidential Addresses for 1849 and following years.

[†] Cf. Sir R. I. Murchison's Presidential Addresses for 1866 and 1867.

10 miles from the principal camp of the tribe, by whom the supposed Classen was detained. They said that the man was very feeble and was frequently carried for long distances by the blacks, by whom he was held in high esteem as a "medicine man." Some two years after Hume's death, Mr. C. Kirwan, a friend of the Messrs. Skuthorpe, passed their station in search of new country, and eventually settled about 180 miles further west at a spot in S. lat. 23° 10′, E. long. 139° 20′, on the River Herbert, and some 40 miles from that part of the Mulligan where Classen was supposed to be detained. Some of the blacks from the Mulligan informed Mr. Kirwan that an aged white man was with them, but they refused to bring him for fear he should not be allowed to return. A month after this (apparently in November 1876) the same tribe, among whom were observed two half-castes, a young man and woman of about twenty and seventeen years of age, returned to the Herbert and said they had told the white man of other white men being on the Herbert, and that he had urged them to take him across, but that they refused, and he had stolen out of the camp at night; that next day they followed his tracks, and found him lying dead in a waterless country half-way to Mr. Kirwan's station. Later on, in March 1877, after Mr. Kirwan's death, Mr. J. R. Skuthorpe visited his station, and while there, went to the Mulligan River to the camp where the white man had been. The blacks refused to say where he was buried, but tated that he had plenty of papers kept in a saddle-bag; they further admitted that they had seen two other white men, and they showed him he inscription, "HUME 1867," which one of them had cut on a tree. Mr. Skuthorpe afterwards learned that the old white man was buried among the high red sandhills between the head-waters of the Mulligan and the Pitcherie Creek, the most westerly branch of the Herbert, and that in all probability the saddle-bag and papers were buried with him.

At first sight there does not appear much in the foregoing to show that the old white man referred to above was necessarily a survivor of Leichhardt's expedition, but in sending us the memorandum and other extracts from the Sydney papers, Mr. Du Faur very fairly observes that "there seems no possibility of the white man in question, who, by the ages of his half-caste children, must have resided with the tribe over a quarter of a century, being other than a survivor of an expedition of that date, or an escaped convict of early times; in the latter case he would not be likely to be in the possession of papers, as described by the blacks." This question of identity may, however, be solved before long, for Mr. E. W. Lamb, writing on March 25th, informs us that he has propounded a scheme to the South Australian Government, by which at a very trifling expense they might obtain these papers, and at the same time open up a new line of road along the 23rd parallel of south latitude, by which stock could be sent from Queensland to Adelaide.

Recent Exploration in Central Australia.—Mr. Carr Boyd, junior, an experienced bushman, has recently made an exploring journey across the Queensland border, by which, our associate, Mr. E. W. Lamb, informs us, when taken in conjunction with Mr. Forrest's route from Champion Bay to Chambers' Pillar, the last link in the line across the continent from east to west is considered to be practically bridged over. Mr. Boyd left the Mulligan River in 24° 33′ S. lat., 139° 24′ E. long., and struck to the west of north for some 45 miles over sandhill desert and spinifex country, and then north-west for 35 miles through gorges, downs, and sandhills to a creek coming in from the north-west. This he followed for 10 miles in a north-west direction over downs with high isolated hills, bearing north and north-west, to its head in the downs. The country traversed is described as really splendid, several descriptions of Mitchell grass, with barley and blue grass, growing there in great profusion. Mr. Boyd next travelled west for 25 miles over downs intersected by belts of timber and highly timbered ridges, to a creek bearing nearly due west. This creek takes its rise in the Cairns Ranges, as they could be seen bearing away to the south. After following it for 50 miles to the north-west, Mr. Boyd found that it bore away too much to the north, and he therefore struck over downs for 10 miles, and came to another creek, bearing to the west, which also had plenty of water in it. He followed this creek for 30 or 40 miles through fine country, when he reached a large river coming from the south. This he named the Maud, which Mr. Lamb considers to be identical with a river already mapped, and named the Waite, but, after carefully plotting Mr. Boyd's route on the large-scale map of Australia, recently published under the superintendence of the Surveyor-General of Victoria, we find that his furthest point was a considerable distance east of the Waite River. Mr. Boyd followed the river for 10 or 15 miles to the north. He had no maps with him, and was apparently unable to fix his position precisely, but he believed himself to be then within 60 or 80 miles of the Overland Telegraph line. He accordingly made an attempt to reach it, determining to turn back if he did not do so in one day's march. After travelling for 45 miles—at first over downs and then for 35 miles through more or less dense scrub—he reached a large sandy creek coming from the north-west, where he got water by digging. Mr. Boyd then turned back, and on the return journey appears to have followed approximately the same line as before. He feels certain that the creeks bearing north-west, which he crossed, are some of the water-courses which fill the great lakes discovered by Messrs. Buchanan and Favenc, probably, he thinks, some 200 or 300 miles to the north. All the country which Mr. Boyd passed over in this trip west of Cairns Ranges was really good, and in most cases the water met with was permanent, but these remarks do not apply to the 25 or 35 miles of country west of what he calls the Maud River, as that was sandy and covered with scrub, and he had to dig for water. From the watershed of the Maud to where he struck Kelly's Creek, a tributary of Manners Creek, Mr. Boyd describes as a very long stretch, and he is not surprised at the Messrs. Prout perishing when they got between the two creeks, as they must have had a terribly long march without water over nearly all loose downs country.

Obituary.

General W. C. Macleod.[*]—William Couperus Macleod was born at Pondicherry, 16th September, 1805. Nominated to a Madras cadetship, he returned to the country of his birth in May 1822, and was posted, first to the 15th, and then to the 30th Native Infantry. He served in the first Burmese war (1824-26), during which he was present at the attack and capture of Donabyu (March 1825), where the famous Burmese general, Maha Bandula, was killed, and at the engagement before Prome (1st December, 1825), besides many minor affairs. In the attack on Syriam by Colonel Elrington's detachment he was slightly wounded (11th February, 1826).

In 1829 Macleod was attached to the Commissariat Department. Some years later it was necessary to close a question regarding the boundary between the Burmese and their immediate neighbour, the State of Manipur ("Munnypore"), a state under British tutelage, and intervening between Eastern Bengal and Upper Burma. The question had been a troublesome one ever since the close of the war, and a constant source of ill-will and irritation at the Court of Ava. The Supreme Government had decided that the Kabó ("Kubo") Valley, which formed the chief part of the disputed tract, should be given up to the Burmese. Captains Grant and Pemberton were despatched from Bengal to meet the Burmese Commissioners, and Lieutenant Macleod was named by Colonel Burney, the Resident at the Court of Ava, to accompany the latter. He received a title and a gold umbrella from the king, and proceeded with his Burmese colleague to Kendat on the frontier, descending the Irawadi and ascending the Kyendwen from its confluence. Lieutenant Macleod's work on this occasion was highly approved, and led the Government to commend his judgment, temper, and address. A report which he prepared on the journey, and the country visited, was sent home, as containing much interesting information, but it does not seem to have been published. It is remarkable that this tract (the Kabó Valley), so far to the westward, is still in part under the rule of Shan princes—a relic of the ancient extension of that race and their power over the whole of Northern Burma and a great part of Yunnan. After his return Macleod compiled a map of the country between the Irawadi and the Kyendwen (*Sonaparanta* in the solemn nomenclature of Burmese official documents, i. e. *Aurea Regio*, a survival of the name which Ptolemy uses), for which he received the commendation of Government. In November 1834 he was appointed a junior assistant to the Commissioner of the Tenasserim provinces. It should be recollected that in the years between the two Burmese wars (1826–1852) we held all that had been the coast of the Burmese Empire from the neighbourhood of Chittagong to Cape Negrais, and from Maulmain to the Siamese frontier in about 10° N. lat.; the intermediate Delta of the Irawadi remaining with the king of Burma. The former, or northern, portion of this annexed seaboard was administered as the British province of Arakan; the latter, or southern portion, as "the Tenasserim provinces." Lieutenant Macleod was posted to Mergui, the most southerly of these provinces, that which included the old city of Tenasserim, now long in decay. The Commissioner reported of him in this charge as a remarkably intelligent and active young officer, with a considerable knowledge of the Burmese language.

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[*] By Colonel H. Yule, C.B.

In 1836 occurred the circumstances which give Macleod's name such strong claim to our commemoration. In the end of that year he was selected by the Commissioner, Mr. E. A. Blundell, to proceed on a journey into the interior of the Indo-Chinese peninsula, with instructions to penetrate to the frontier towns of China, in view to opening out commercial intercourse between the Chinese traders, who were in the habit of visiting the towns of Siamese Laos near our frontier, and our provinces on the coast of the Bay of Bengal. Macleod started 13th December, 1836, first visiting the Siamese Shan (or Laotian) principalities of Labong and Zimmé (or Xieng-Mai, the *Jangomai* of our old travellers, where the East India Company had a commercial agent in the early years of the seventeenth century). There were here various questions to be discussed in regard to the police of the frontier; questions that recur to the present day, and have lately led to proposed arrangements for constituting a Vice-consul at Zimmé. Macleod had the greatest difficulty in obtaining information about his onward route. Those who could have given it either had an interest in misleading him, or were schooled to do so. But he received better aid from the Chinese traders themselves, who meanwhile arrived at Zimmé. He left that place on the 29th January, 1837, and reached Great Kiang-Tung, the seat of the largest of the Burmese-Shan states, on the 26th February. Here he was kindly received by the *Tsabwa*, as the Burmese term those Shan princes, an active-minded man, though blind. This was a place much frequented by the Chinese traders, and the focus of a variety of routes from Southern Yunnan both towards Maulmain and towards the various Shan states subject to Burma and Siam.

Kiang-Tung (Xieng-Tong of the French exploring expedition of the Mekong) has been twice visited since Macleod's time; viz. in September 1866, by Captain Doudart de Lagrée and Dr. Thorel of the French expedition, and in the beginning of 1870 by Mr. J. N. Cushing, a missionary (we believe, of the American Missions in Pegu). The French officers have recorded an honourable testimony to Lieutenant Macleod: "The visit paid by Macleod in 1837 to the father of the king of Xieng-Tong, a visit of which the king had retained the most kindly recollection, was perhaps one of the most efficient causes of the good-will which he showed to the French travellers. The way in which he often spoke to M. de Lagrée of the English officer, of his dress and of his instruments, proved that all these particulars had impressed him like the revelation of a superior civilisation." * Mr. Cushing also no doubt benefited by the good impression made by the Frenchmen, as well as by the tradition of Macleod. He says: "The Tsaubwa has a deep respect for the wisdom of the white faces. He received us cordially, surrounded by all his ministers, and a great multitude of people. We dined almost daily at the palace, and, being so kindly received by the Tsaubwa, all the people were likewise very friendly." †

Leaving this hospitable little Court on the 1st March, 1837, Lieutenant Macleod reached Kiang-Hung (Xieng-Hong of the French) on the 9th. This state, known to the Chinese as Cheli-Fu, is one of the most inaccessible of the quasi-civilised states in the heart of Indo-China, and one that in a typical manner illustrates the felicity of that geographical title, drawing as it does the more ancient elements of its civilisation from India, and the more recent elements from China. It is itself apparently a fragment of the extensive kingdom of Laos which existed on the Mekong and to the west of it in the Middle Ages, and has in later generations suffered from its position between China, Burma, and Siam, having been tributary to all three, which it is still to the first two, though it is to China that it now chiefly seems to look as paramount. This place, as far as we know, has only been visited by Macleod, and by the French expedition thirty years later (September 1867). Macleod's determination of the latitude (21° 58′), after allowance for a slight subsequent translocation of the capital, agrees entirely with Garnier's. In the longitudes there is a difference of 9 miles.*

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* Garnier, 'Voyage d'Exploration,' i. 393.

† We translate from Petermann's 'Mittheilungen,' 1871, pp. 215–17; not having met with Mr. Cushing's original narrative.

The court at Kiang-Tung treated Macleod with civil suspicion. He stayed there till the 23rd March awaiting the decision on his application for leave to cross the Chinese frontier, which the regency at Kiang-Hung had sent on to Yunnan-fu. The reply at last came back that "the authorities had consulted all their historical works, and could not find a precedent for an officer entering China" by that road; he should go to Canton.

So Macleod had to return by the way he came, arriving at Maulmain on the 27th May, 1837. But he had succeeded in reaching, without a companion, a point in the very heart of a *terra incognita*, and bringing us back the only defined knowledge that we had of it till 1870, when Garnier's reports were published. Macleod was a good observer and surveyor, as well as a man of great merit in other ways, and of notable modesty. His journey was not much known except to those who concerned themselves with the geography of Indo-China—not a very large body—until it (perhaps unfortunately) was got hold of and misused as a kind of fulcrum for the absurd agitation to drive a railway from Pegu into Yunnan—an agitation taken up at haphazard by so many of the Chambers of Commerce in this country, to their discredit. The journey was never acknowledged by any gold medal or otherwise, and indeed we find no allusion to Macleod's name in any Presidential Address or paper in our Society's Journal, except in Colonel Yule's paper on the "Geography of Burma" (Journal for 1857), in which his MS. journals are several times quoted. For many years the only accessible account of the journey—and that not very accessible—was an abstract published in vol. vi. of the 'Journal of the Asiatic Society of Bengal'; but at the time of the agitation referred to the diary *in extenso* was printed by order of the House of Commons (August 10th, 1869).

Captain Macleod continued to serve in the Burmese provinces for a number of years. In 1847 he was transferred to Orissa as Principal Assistant to the agent for the suppression of Meria (human) sacrifices among the hill-tribes in that region, but we are not aware whether he ever joined that appointment, for in the same year (1847) he returned at his own request to military duty, to which he remained attached for the rest of his career. After commanding successively the 30th, the 29th, and the 40th Madras Native Infantry, he was (1859) appointed Brigadier in command of the Malabar and Canara district, and three years later to that of the Nagpur force (June 1862). He returned to Burma in 1863 as Brigadier-General in command of the Pegu division, a position which was exchanged in 1864 for the command of the Ceded Districts in his own Presidency. This command he held till 1868. General Macleod being past the age of seventy was in 1877, in accordance with the superannuation system then introduced, removed to the retired list. He died at his house in Gloucester Gardens, 4th April, 1880, aged seventy-four.

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* Some part of this difference may probably be due to the longitudes adopted for the respective starting points—Maulmain and Saigon. Captain Macleod's latitudes were fixed by observation almost daily. He did not fail to take lunars also; but he states that as he had doubts about his instruments, and had no Nautical Almanac when preparing his map, he preferred to calculate his longitudes from his compass survey, checked by the frequent latitudes observed.

One who himself has risen to high distinction in the Burmese provinces and elsewhere in the public service, Sir Arthur Phayre, writes of Macleod:—

"I first saw him as far back as 1837 at Mergui, where he then was Assistant-Commissioner in charge of the district. I went there on a tour from Maulmain, where I was employed in assisting to raise a corps of Talaings. What I then specially remarked of Macleod was his kind disposition and treatment of the people under his charge, and the great confidence they had in him. I remember thinking at the time that if I ever was in Civil employ I should endeavour to do like him. . . . . In 1848 I succeeded him as Deputy-Commissioner at Maulmain. I now had an excellent opportunity of knowing the high esteem in which he was held by all—Europeans, Burmese, Indians, and other Asiatics. . . . . I last was connected with him in Rangoon, when he commanded the division. I never met a man more quiet, conscientious, and conciliatory in my life."

Professor D. P. Ansted, M.A., F.R.S.—This well-known geologist and writer on physical geography passed from amongst us on the 13th inst. in the sixty-sixth year of his age. He had travelled much; in the earlier part of his career as a scientific inquirer and afterwards in the exercise of his profession as a mining geologist, and had published from time to time books of travel which displayed much literary as well as scientific ability. For many years he occupied a prominent position, especially in the scholastic world, as a writer on physical geography, his Manual on the subject, published in 1867, having run through many editions and become a recognised text-book in the science-classes of schools. A smaller work in the same branch of science, entitled 'The World we live in,' had a still wider circulation. Having thus acquired a wide reputation as an authority in this popular branch of scientific education, Professor Ansted obtained the appointment of Examiner in physical geography under the Department of Science and Art at South Kensington, a post which he held for many years, and relinquished only when Physical Geography was abolished, in name, as a branch of scientific teaching, and replaced by Physiography, under a new examiner. He graduated at the University of Cambridge as Wrangler in 1836, and was appointed to the chair of geology at King's College in 1840; teaching the science not only there, but at Putney College and the Military Academy at Addiscombe. For many years he acted as Assistant-Secretary of the Geological Society, in which capacity he edited the Quarterly Journal of that body. He was a man of unflagging industry, and in addition to his other regular labours was often employed in lecturing on geology and kindred subjects at provincial institutions. The chief works in geology and travel emanating from his prolific pen were his 'Geology, Descriptive and Practical,' published in 1844; 'Historic Sketch of Creation,' 1847; 'The Gold-Seeker's Manual,' 1849; 'Scenery, Science, and Art,' 1854; 'Short Trip in Hungary and Transylvania,' 1862; 'The Channel Islands,' published in conjunction with Mr. R. G. Latham, in 1862, and 'The Ionian Islands,' 1863. He was a Fellow of our Society since 1853.

REPORT OF THE EVENING MEETINGS, SESSION 1879–80.

Eleventh Meeting, 26th April, 1880.—The Right Hon. the Earl of NORTHBROOK, G.C.S.I., President, in the Chair.

ELECTIONS.—*Andrew Chirnside, Esq.*; *Major-General Charles Foster*, C.B.; *Russell King Hall, Esq.*; *Colonel T. Inglis*, R.E.; *Lieut.-Colonel George W. Knox Scots Guards*); *Trevor C. Plowden, Esq.*; *John Henry Spitzly, Esq.*; *S. W. Stevens, Esq.*

The three Uganda chiefs—Ramkadi, Kataruba, and Sawaddu—ambassadors from King Mtesa to the Queen, who had arrived in England a few days previously, were present at the meeting.

The PRESIDENT, in introducing to the Meeting the authors of the papers, said that he Rev. C. T. Wilson, of the Church Missionary Society, had lived in Uganda for more than two years, and had obtained probably a greater acquaintance with the Victoria Lake than any other European. He would give the Society the result of his experience of the people of that country. He had been accompanied to England by three Uganda chiefs, who were now present. They belonged to the highest lass but one of the nobility of their kingdom, and they had been sent to England y King Mtesa in order to obtain a knowledge of this country, and at the same ime to convey presents to Her Majesty. Their presence would no doubt be of nterest to the Meeting, whilst listening to the account which Mr. Wilson would ive of King Mtesa and his court and country. Mr. Felkin, the author of the second aper, was the medical member of the Uganda mission. He had travelled to Uganda nd back viâ the White Nile and Unyoro, and was probably the first Englishman who had visited both the Albert and the Victoria lakes. His paper would chiefly eal with the remarkable journey by land through the country of the White Nile which the party accomplished on their return to Europe.

In conclusion, the President welcomed the three chiefs, on behalf of the Society. He was sure everyone who was connected with the Royal Geographical Society, or who had the interests of Africa at heart, would do all in their power to make their tay in this country pleasant and instructive.

The following papers were then read :—

1. "Uganda and the Victoria Lake." By the Rev. C. T. Wilson.
2. "Journey to the Victoria Nyanza and back, viâ the Nile." By Mr. Felkin.

Vide ante, pp. 353, 357.

The Rev. C. F. WILSON said that the three chiefs present had come to England s ambassadors to the Queen from His Majesty Mtesa, King of Uganda, Unyoro, Usoro, and Karagwe. It must not be supposed that because they were great in heir own country, therefore they were at all accustomed to a scene like the present. He was afraid they were a little overawed at finding themselves before such an august assembly. Of course it was very difficult for anyone who had not visited Central Africa to realise the change in passing from that country to this. Before he went to Africa he had read almost every book that had been published on the ubject, and he thought he knew a great deal about it; but before he got 20 miles rom the coast he found that he knew nothing at all. Their visitors could not speak English: they had never before seen a stone house, or even a house with more than ne story. In their own country the houses were like great beehives, with only one tory and one door. They had no beds, but slept on the floor; no tables, no chairs, o spoons, no forks. For all that, the Waganda were a very cleanly people. They ctually had dinner napkins and pocket-handkerchiefs, although they had no pockets to put them in. When a person went to a great chief's house to dinner, he was taken into the principal hut, for the chiefs had perhaps thirty or forty huts in one enclosure. His wives, numbering twenty or thirty, would then bring a number of fresh green banana leaves and lay them on the floor. A large basket would be brought in with perhaps a couple of sheep cut up, and a half-hundredweight of bananas, which were tumbled out in a great heap. Then a circular napkin, about as large as an ordinary dinner plate, made of the inner tissue of banana stem, was given to each guest, who washed his hands with it, and then fell to, every man for himself. When the eating was finished, fresh napkins were brought round. These napkins were exceedingly convenient, because they were water and towel all in one. The fibre of the banana contained so much moisture that, when it was squeezed, a great deal of water flowed out. Finger glasses were unknown, and in fact would be an unnecessary luxury. After dinner, coffee was brought, but not to drink. Little baskets of green coffee berries were handed round, and each man was expected to take two or three and chew them. Coffee as a drink was utterly unknown there, and if a cup of coffee were given to them they would not know what to do with it. Their weapons were spears and shields. Guns were not very common, in consequence of the great difficulty of taking them up from the coast. The people did not understand taking aim with them, always firing from the hip, and if they hit anything they were more surprised than otherwise. With the spear they were exceedingly clever, some of them being able to send one completely through the boss of a shield made out of one solid block of wood, covered with neatly plaited basket-work. The Waganda were celebrated for their basket-work; in fact, their houses were little more than huge baskets. A dome-shaped framework of reeds was first built up, pieces were added to the bottom, and it was gradually lifted up until it attained the proper size. It was then thatched over. Baskets were used as vessels to drink from, one great shallow basket being the family drinking cup. The native beer, made from bananas, was poured into this, and the whole family drank from it like a litter of pigs, stooping down and drinking. Some idea might therefore be formed of the great change which it was for such people to come before a well-dressed assembly in England.

Colonel J. A. Grant said it was a great pleasure to him to be present, and meet two gentlemen who had just returned from Uganda. Mr. Wilson in going there followed nearly the same route as Captain Speke and himself eighteen years ago, when they started from Zanzibar to reach what was then an unknown country. Speke, as we all knew, was the first to discover the southern end of the lake during the Tanganyika expedition. In the subsequent journey on which he (Colonel Grant) accompanied him, Speke mapped out the lake in the general shape which it was now known to have. But, as Mr. Wilson correctly said, the ins and outs of the lake had still to be surveyed. The king of Uganda, whom Speke and himself found reigning there, was the same person who for two and a half years had been such a friend to Mr. Wilson and his party. He could not speak too highly of Mtesa. Speke and himself were the first white people who had ever been in the country; he had probably never before heard of white men; they were entirely at his mercy, and it would have been the easiest thing in the world for him to have killed them both, or sent them back as some of his advisers recommended. Speke, however, stood to his point, and they remained there until at last they gained permission to pass on to Egypt. But this was not the only instance of Mtesa's kindness. Sir Samuel Baker, when he discovered the Albert Lake, was in great difficulties, and nearly lost his life when the Wanyoro attacked him. He sent for help to Mtesa, and Mtesa despatched his commander-in-chief 120 miles to rescue him and Lady Baker from the Wanyoro. Colonel Long, when sent by the Egyptian Government to Mtesa, brought us the strange news that there was no such thing as the Victoria Nyanza, and that the so-called lake was merely a creek. He had, in fact, not seen the lake itself, but only one of its inlets. However, King Mtesa treated Colonel Long with his usual thorough kindness. Again, when Linant de Bellefonds was sent by General Gordon to Uganda, Mtesa received him also most heartily. But we must not forget the greatest of living African travellers, the man who originated the movement which led to the present mission to Uganda—I mean Mr. H. M. Stanley, who circumnavigated the lake in 1875, and wrote from Uganda of his kind host as follows on the 14th of April, 1875:—

"Mtesa is a great king. He is a monarch who would delight the soul of any intelligent European, as he would see in his black majesty the hope of Central Africa. He is king of Karagwe, Uganda, Unyoro, Usoga, and Usui. Each day I found something which increased my respect and esteem for him. He is fond of imitating Europeans, and what he has heard of their great personages, which trait, with a little tuition, would prove of immense benefit to his country. He has prepared broad highways in the neighbourhood of his capital for the good time which is coming when some charitable European will send him any kind of wheeled vehicle."

All these circumstances entitled Mtesa's ambassadors to a thoroughly hearty welcome from the English people. Captain Speke received from the king what is considered by Uganda etiquette the highest mark of honour—two spears and a shield, and about eighteen months ago he (Colonel Grant) received a similar present. These spears were beautifully made and balanced, certainly no better manufactured spears could be turned out in either Birmingham or Sheffield. Throughout his whole journey from Zanzibar to Egypt, he met with no race equal to the Waganda in refinement of manner, cleverness, intelligence, and neatness of workmanship. There was evidently the making of a great nation in the Waganda, if a road could be opened up to the coast for them, either from the east or the west. There were many routes which might be made available to the lake. Stanley might establish means of communication with the Congo, or the Welle might prove to be the head-waters of the Niger, and thus a route might be opened to the west coast; but Mtesa ought to have a route to the east coast of Africa, either from the north or the south end of Victoria Lake to the River Dana, or to the missionary station of Mombasa. A great debt of gratitude was due to the Church Missionary Society for having sent out so many brave fellows to explore that country.

Mr. HUTCHINSON said events moved very rapidly in these days. Only ten years ago Livingstone was lost in Africa, and now a company was established at Zanzibar which quoted rates at which they would carry merchandise to Tanganyika or Victoria Nyanza. He remembered when, only four years ago, Colonel Grant read a paper on Stanley's exploration of the Victoria Nyanza. Sir Samuel Baker, who was present, said that no one in his senses would think of sending a mission to Mtesa. On that occasion he (Mr. Hutchinson) announced that the Church Missionary Society would send out a mission, but he did not think that within four years men like Mr. Wilson would return to give an account of how much they had done. Mr. Wilson might have spoken of his labours for nearly a year and a half alone in Uganda; how he did his duty, trying to instruct the people; how he navigated the lake; how he was wrecked in the *Daisy* and came to grief on the shores of Usangoro, not far from Bamberé, and how he received the greatest kindness and hospitality from the natives who helped him to reconstruct his vessel. He had seen a little of Mtesa's ambassadors since their arrival in England, and could testify to their power of adapting themselves to circumstances. They had come to see what England had done and could do, and on their visit to the Zoological Gardens nothing had struck them so forcibly as the sight of the wild animals which they had been accustomed to see in their own native jungles, tamed and caged in London. Their astonishment reached its climax when they saw the great African elephant walking about. He was present when Colonel Grant was introduced to them as the companion of Speke. The name of "Spekee" seemed to be remembered to the present time, and Mr. Wilson told him that he believed if Speke were now alive he might walk across Africa, following the route he traversed in the old days, and no one would think of touching him. There were mighty schemes on foot for opening up Africa: some of them, commercial enterprises, might fail; but the work was moving with wonderful rapidity. He hoped that ultimately a strong mission would be established on the Victoria Nyanza.

Twelfth Meeting, 10*th May*, 1880.—The Right Honourable the Earl of NORTHBROOK, G.C.S.I., President, in the Chair.

PRESENTATION.—*Alexander Hay Japp, Esq.*

ELECTIONS.—*John Hurst Martin, Esq.*; *Henry Augustus Severn, Esq.*

A paper was read on:—

"A Journey in the interior of British Guiana." By Mr. Everard F. im Thurn. Will be published, with the discussion which followed it, in a subsequent number of the 'Proceedings.'

PROCEEDINGS OF FOREIGN SOCIETIES.

Geographical Society of Paris.—May 7th, 1880: M. A. GRANDIDIER in the Chair.—The President alluded to the presence at the meeting of Madame Carla Serena, who has had the courage and the energy to undertake alone extensive journeys, during which she has made valuable scientific notes in physical geography and ethnology. Starting from London in 1874, Madame Serena visited first different parts of Western Europe, Norway and Finland, continuing thence to Russia, the Danubian provinces, Turkey, Egypt, Syria, Asia Minor, and the Caucasus. She resided two years in the Caucasus, traversing on horseback the least known provinces and collecting interesting data regarding the country and people. Returning to Turkey at the time of the recent war, she was arrested as a spy and carried off with a convoy of Turkish prisoners. On being restored to liberty she went again to the Caucasus, wintered at Teheran, and afterwards traversing the Caspian, lived for some time in a tent among the Kalmucks on the steppes of the Volga, finally returning to Moscow after four years' wanderings.—The President mentioned also the presence of Dr. Panagiotes Potagos, a distinguished Greek traveller, who, quitting Greece in 1867, had visited Northern Persia, Herat, Candahar, and Kabul (at which city he remained some time), and crossing the Hindu Kush by one of the most difficult passes, had travelled through Badakhshan, Wakhan, and the whole of Kashgaria as far as Tuksum, reaching, in 1871, Hami. He was retained prisoner by the Chinese at Hami on a second visit to the place, and all his collections and journals were destroyed, his profession as physician alone saving his life. Escaping from Hami, he proceeded to Kulja and returned to Europe viâ Semipalatinsk and Ekatherineburg. After two years spent in Greece he resumed his wanderings in 1874, proceeding to India with the intention of again visiting Kabul, but the English authorities at Peshawur refused him a passage, and he therefore descended the Indus to Karáchi and travelled to Kabul viâ Bunder Abbas, Laristan, and Seistan. From Kabul he reached India by the Kurram Valley and embarked at Bombay for the east coast of Africa. The years 1876 and 1877 were passed by him in ascending the Nile from

Egypt, and travelling in Darfur and in the region of the Bahr el Ghazal and Djur. He reached as far south as 3° N. lat., in about 20° 30′ E. long. (Paris), where there is a large river flowing from east to west, bearing the name of Béré, with a tributary called Tzigo running from north to south. North of this stream and W.S.W. of Hofra en Netras, Dr. Potagos visited an establishment of Nubian slave-dealers named Zeriba Nur, after its owner. It is supposed that the River Béré is the same stream as the Welle and Shary. Dr. Potagos traces it from east to west, a little south of the third parallel of north latitude, between 23° 20′ and 21° 20′ E. long. (Paris), whilst Dr. Schweinfurth, who saw the Welle near Munza, the capital of the king of Monbuttu, in about 3° 35′ N. lat., and who has indicated its course some distance further down, gives the river a westerly direction along the parallel of Munza. This indication is correct for the first 120 or 130 miles of westerly course, but further on and before reaching the village of Bakangoï visited by Miani in 1872, the Welle, or Béré, curves to the south, according to Dr. Potagos' map. It resumes its westerly direction only near the village of Inguima, in about 3° N. lat. and 23° 20′ E. long. (Paris), and it preserves this direction as far as about 20° 40′ E. long. (Paris).—A communication was then read from M. L'Abbé Desgodins, relating to the journey that he has just accomplished from Ta-tsien-lu to Cha-pa. This latter locality lies about 4260 feet lower than Ta-tsien-lu.—A paper was next read on his explorations between the Yellow River or Song-Koï to the Tongkin, by M. Dupuis, in which the author believed himself authorised to claim the priority of the discovery that this stream is navigable.—It was announced that the travellers MM. Rey and Montano had quitted Solo and landed at Mindanao.—The Secretary then announced that, on the initiative of the Society of Paris, the Italian Geographical Society had decided that an International Congress of the Geographical Sciences shall be held at Venice during the autumn of 1881. The municipality of Venice had voted 10,000 lire to meet the expenses.—A communication was then read from Count Meyners d'Estrey on a new interpretation of the Map of Ptolemy.

—— May 21st, 1880: M. GRANDIDIER in the Chair.—The Chairman announced that the Central Committee, at their meeting of May 14th, had unanimously decided that, when one of the members of any great scientific expedition had rendered exceptional services to Geography, they shall have the power of conferring on him in recognition of his merits the title of Corresponding Member if he be a foreigner, and of Life Member if he be a Frenchman. In pursuance of this resolution, Lieutenant Palander, who contributed so largely to the success of the *Vega* Expedition, has been elected a Corresponding Member, and Dr. Ballay, who so courageously shared the dangers and labours of M. Savorgnan de Brazza on the Ogowé, has been elected a Life Member.—MM. Harmand, Schrader, Vidal-Lablache, and Paquier have been appoined Assistant Members of the Central Committee.—The Minister of Marine and the Colonies announced that M. de Brazza had left the Lambaréné factories for Okandas on March 17th.—A communication from M. Soleillet was read, giving an account of the circumstances which had put an end to his second attempt to make a journey from Senegal to Algeria by way of Timbuktu. M. Soleillet at first travelled in the Trozza country in a direction almost parallel to the sea-coast, and was hospitably entertained by King Ely for three days; he then went on to visit Sheikh Sâad-Bou in Adrar. He met the chief at Bir-Iggueni, and was recommended by him not to advance further, because, owing to all the chiefs being in the south, the country was deserted, and there was great risk of encountering bands of robbers. Though advised to put off his journey for a year until the return of the chiefs, M. Soleillet thought he ought to proceed, and three days after, armed with a letter from Sâad-Bou, and accompanied by some *talibés*, or marabouts, he started again. Soon, however, the expedition was encountered by a party of Ouled-Dlim, who without any provocation attacked M. Soleillet's servant and wounded him three times. M. Soleillet ran to his assistance, and the robbers withdrew to some distance. The *talibés*, who are forbidden to strike a blow, even to protect their own lives, interposed to the best of their ability, and thanks to the arrival of three messengers from Sheikh Sâad-Bou, it was arranged that the travellers should be allowed to retire unharmed on condition of abandoning their merchandise. M. Soleillet was, however, able to save his instruments, arms, papers, books, his geological and botanical collections, and even some merchandise. He congratulates himself on having avoided bloodshed, which would certainly have compelled the abandonment for many years of any further attempt to make the journey. He states his intention of returning to Senegal in a few weeks, and of renewing for the third time his efforts to reach Algeria from the south.—The death was announced of Père Horner, who was an Honorary Corresponding Member of the Royal Geographical Society, was the founder of the village of Mhonda, about 120 miles from Bagamoyo, at the foot of Mount Nguru, and a zealous promoter of the abolition of the slave trade on the Zanzibar coast. He died at Bordeaux on May 20th, from exhaustion caused by the privations he had gone through, combined with the effects of the climate of Equatorial Africa.—M. Simonin read a paper on the Indians of the United States in 1879, in which he brought out, by means of official documents, the immense decrease in the Redskin race, and the constant endeavours both of the United States Government and of private individuals to improve the condition of the Indian population. The conclusions at which he had arrived were, however, disputed by several speakers.

Geographical Society of Lyons.—April 1st.—After some remarks by the President on the general and inexplicable impetus which is urging all the nations of Europe to take part in the exploration and civilisation of Africa, Père Charmetant, Procureur-Général of the Sahara and Soudan Missions, delivered an address in which he dealt chiefly with the future of the African populations, and the necessity for abolishing slavery and driving it out of the countries where it now exists. In the course of his observations he referred to what, in his opinion, are the causes of the slave-trade, attributing it largely to the prevalence of Mahomedanism. Père Charmetant afterwards explained the means which were being used by the Roman Catholic missionaries in Africa for the gradual civilisation of the natives. Père Charmetant, it may be added, took a leading part in the organisation of the Algerian Missionary Society's first expedition to the lake district of Equatorial Africa (vol. i. p. 453), and has recently published a map of a portion of that region (*ante*, p. 344).

Imperial Geographical Society of St. Petersburg. — April 21st.—The Secretary submitted detailed information respecting the organisation of Polar stations for scientific observation, in accordance with the programme arranged by the International Polar Conference at Hamburg last October.* He stated that, thanks to the subscriptions received for this purpose, the Society was now in a position to organise two stations of this kind, one at the mouth of the Lena and the other in Eastern Siberia. In all probability, scientific observations will be commenced at these stations at the beginning of next year.—M. Séménof, Vice-President, afterwards read a report on the statistical results of the inquiry into the agricultural production of the eight central governments of the empire.

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* Vide 'Proceedings R. G. S.,' vol. i. p. 738.

graphical Society of Cairo.—April 19th.—It was announced that Colonel
Pasha and Colonel Mason-Bey had been elected honorary members of the Society
great services to African geography. Colonel Sadik-Bey gave the concluding
of the narrative of his journey to Medina, illustrating his remarks by means
and views. M. Bonola, the Secretary-General, afterwards addressed the
on the value of the Society's library, and stated that it ought to contain all
hat are published in Egypt and on Egypt, as well as everything relating to

gentine Geographical Institute.—April 24th, 1880: Dr. Zeballos, Presi-
the Chair.—A plan, constructed by Major F. Host, was exhibited, showing the
perations of the fourth military division to the south of the Upper Neuquen in
dillera of the Andes. This plan consists of three sections, of which the first
the basin of the Neuquen from its source to the fort of the fourth division,
nce to its confluence with the Limay, where the two rivers form the Rio
and all the affluents of the two rivers, the military posts, &c., are laid down.
ond section is devoted to the basin of the Rio Macké-Leuvu or Agrio, one of
est affluents of the Neuquen, which was previously unknown, and is found
d by numerous rivulets from the neighbouring valleys. The third section
the ridge of the Andes, forming the watershed of the rivers which flow
Argentine and Chilian territory, with all the noteworthy features of the
from the Pichochen volcano to the Chilian town of Antuca on the west, and
the Uilliatné Lagoon on the south, a region lying a little to the north of the
of the confluence of the Neuquen and Limay. The various routes of the
ng parties are also shown.—Dr. Zeballos afterwards gave an account of his
tions in the Pampas, and in particular of his scientific discoveries on the
a Mountain.—The reading of a paper by Major Host on his recent expedition
ordillera was unavoidably postponed to a future meeting.

NEW BOOKS.

(By E. C. Rye, *Librarian* R.G.S.)

EUROPE.

, F.—Donau-Bulgarien und der Balkan. Reise-Studien aus den Jahren
-1879. Zweite neu bearbeitete Auflage. Leipzig (Fries): 1880, sm. 4to.,
ung 1, pp. 64, pls., woodcuts. (*Williams & Norgate*: price 4*s.*)

, C.-É.—Bibliographie Générale des Gaules. Répertoire systématique et
bétique des Ouvrages, Mémoires, et Notices concernant l'Histoire, la Topo-
ie, la Religion, les Antiquités et la Langage de la Gaule jusqu'à la fin du V^{e}
Paris (Ruelle, &c.): 1880, 8vo., première livraison, pp. 416, in double
n. (*Dulau*: price 6*s.*)

The title sufficiently explains the scope of this projected work. The books,
, mentioned are classified by subjects; those referring to topography are
ided into ancient and modern, with separate treatment by regions and depart-
nts, of which the present livraison reaches Gers.

ASIA.

, W. P.—Our Scientific Frontier. London (Allen): 1880, 8vo., pp. 103,
ppendices, pp. 15 and 24, map. Price 6*s*.

The author, who has given much attention to the development of the
ources of Scinde and the Punjab by railways, &c., here gives a sketch of the

chief geographical and economical features of Afghanistan, with a summary of its history, and of the independent border tribes. He also puts forward the views of well-known military authorities as to the necessity of extending and strengthening our north-western Indian frontier.

Gordon, R.—Report on the Irrawaddy River. Part I. Hydrography of the Irrawaddy River; and Part II. Hydrology of the Irrawaddy River, with Appendices and Supplements A, B, and C, pp. 186; Part III. Hydraulics of the Irrawaddy, with Appendices and Supplement D, pp. 213. Rangoon (P. W. Secretariat Press): 1879, fo., maps and tables. (*D. Nutt & Co.*)

It is understood that the third volume and atlas of plates of this work are in course of preparation. The investigation of the causes of the floods of the Irrawaddy has necessitated an attempt to form some conception of the extent and peculiar conditions of its valley, as yet remaining doubtful; and Mr. Gordon comes to the conclusions (1) that this river is continuous with the Tibetan Sanpo; (2) that it receives the drainage of no cther great Tibetan river; and (3) that the Sanpo is not connected with any other great river flowing to the sea, thus agreeing with D'Anville, whose views have been ignored or rejected by most modern geographers. In support of these opinions, the author discusses all past records of surveys bearing on the upper waters of the Brahmaputra; the works of Bedford, Wilcox, and Burlton, though avowedly opposed to the views of D'Anville and Klaproth, being thought non-conclusive, or, if anything, favourable to the connection of the Sanpo and Irrawaddy. In the progress of the Report, the author has become acquainted with the recent exploration of the course of the Sanpo by the native "N–m–g," first by a report in the 'Times' of Mr. C. E. D. Black's paper, read at the last British Association Meeting, and afterwards by General Walker's more detailed account with map, given in the 'Proceedings of the Asiatic Society of Bengal' for August 1879. It will be remembered that this native explorer followed the downward course of the Sanpo to a point (Gya-la Sindong) supposed to be opposite to and only 100 miles distant from the highest known point of the Dihong tributary of the Brahmaputra, after being found to take an unexpected and great bend to the northward before entering on its supposed south-eastern course towards Assam. The surmise that the vast additional catchment-basin (10,000 square miles) thus afforded, is solely devoted to the supply of the Subansiri tributary, accounting for its great volume, and thus doing away with any idea of its waters be derived from the Sanpo, is considered erroneous, (1) because the Subansiri alre has a known supply area of from 5000 to 6000 square miles, sufficient in th region of very heavy rainfall, and judging by the known data of the neighbour Dibong and Bramakund rivers, to account for its high flood discharge, and because the addition of the whole of this new area would of necessity give a of discharge vastly in excess of what it is known to possess. It is theref considered that the newly discovered water-supply is devoted to the Dibo alone. This tributary has already been proved by survey to occupy a la region lying north of the Subansiri watershed and between it and the Sanpo, all little short of 10,000 square miles; and the addition of the fresh basin 10,000 square miles amply suffices to provide its total discharge as estimated Lieutenant Harman. This maximum discharge, moreover, cannot possib include that of the Sanpo, even at the low calculation made by the former nati explorer known as the "Pundit," which is considered by Mr. Gordon much beneath the truth. He therefore concludes (after showing the enormo volume of the Irrawaddy, its great floods high up the river, and the sma volume of its tributaries) that it is impossible to doubt any longer that th Sanpo and the Irrawaddy are one river; and that the Brahmaputra, like th Ganges and the Indus, has been wrongly supposed to break through the grea Himalayan chain.

In Parts I. and II. of this Report, much technical information is given concerning the floods as they appear in the delta of the Irrawaddy, both a to amount and mode of occurrence; and the various physical agencies concerned in the supply and distribution of rainfall are enumerated and passe in review, after an approximate determination of the boundaries, areas, and relative positions of the gathering grounds of the valley. Part III., the largest, is purely technical. The three maps are hydrographical, orographical, and hyetographical (or rainfall) sketches of the southern portion of the Asiatic continent.

unter, W. W.—A Statistical Account of Assam. London (Trübner & Co.): 1879, 2 vols. 8vo., pp. 420 and 490, maps.

These volumes deal with the province of Assam as constituted in 1874, when a separate Chief-Commissionership was withdrawn from the Lieutenant-Governorship of Bengal, consisting of two river valleys (the Brahmaputra with an area of 20,683 sq. miles, and the valley of the Bárak and Surmá, covering 6668 sq. miles), separated by a lofty hill tract. This is now divided into eleven districts, with an aggregate population of 4,132,019, and a total area of 41,798 sq. miles.

No general account of the province is here to be found, as it is given under the article "Assam" in the author's 'Imperial Gazetteer of India,' now in the press; but, under the separate headings of the districts above referred to, the first part of each is devoted to the physical conditions (area, boundaries and general aspect, mountains, river system, lakes, lines of drainage, forests, quarries, *feræ naturæ*, &c.); after which, the people, agriculture, industries, and administration, and the medical aspects of each, are discussed in detail. Vol. i. contains the districts of Kamrup, Darrang, Nowgong, Sibsagar, and Lakhimpur; and vol. ii. those of Goalpara (including the Eastern Dwars), the Garo, Naga, Khasi and Jaintia hills, Sylhet, and Cachar. Under the heading of the last district, pp. 434–445, is given a short history of the tea plantations, with an account of the processes of tea cultivation and manufacture, supplied by Mr. S. C. Davidson from local personal experience. A very large amount of topographical, ethnological, and economical information is compressed in this work by Mr. Hunter, who has incorporated all available details from reliable published works and reports, as well as matter supplied direct by officials and residents in the country; so that the want of a trustworthy recent account of this specially interesting province will no longer be felt. A full index is given at the end of the second volume; and each volume has a copy of the coloured map of the whole province (scale 24 miles to the inch), which is that issued by the Surveyor-General, Calcutta, from the work of Colonel Godwin-Austen and others, corrected to 1878, and photozincographed by Major Waterhouse.

ppert, Ernst.—Ein verschlossenes Land, Reisen nach Corea. Leipzig (Brockhaus): 1880, 8vo., pp. 315, maps, pls. (*Dulau*: price 8*s*.)

The English translation was noticed in the present vol., p. 139.

ocher, Émile.—La Province Chinoise du Yün-nan. Paris (Leroux): 1879 and 1880, 2 vols. large 8vo., pp. 286 and 291, pls., maps. (*Dulau*: price 1*l*.)

The author, who belongs to the Chinese Imperial Customs Service (the head of which, Mr. Robert Hart, has undertaken the expense of publication of this work—a valuable testimony as to its merits), accompanied M. Dupuis, in September 1870, on his journey to Yün-nan-fu during the recent rebellion in China, arriving in February 1871. M. Dupuis returned to the capital in September, leaving M. Rocher, who, with the object of organising an arsenal, commenced to study the metallurgical resources of Yün-nan, in which province he made various excursions, favoured by his official position. He was compelled by sickness to return to Shanghai at the end of 1872, and having recovered his notes and journals, has from them written a description of the localities actually visited by himself, with a sketch of the resources of the province, which he considers to be certainly one of the richest of the Chinese empire.

The first part, which is of chief geographical interest, contains the route from Han-kow to Yün-nan-fu, viâ Ch'ung-ch'ing; also routes from Yün-nan-fu to Chêng-chiang and Hsin-hsing-chou, from Hsin-hsing to Mêng-tzŭ, Ta-chuan to Yün-nan-fu, and Mêng-tzŭ to Man-hao. An historical essay on Yün-nan is also given, from the conquest to the present time.

The second part commences with an account of the aborigines of Yün-nan, followed by an historical sketch of the Mussulman rebellion in its successive phases, in observing which the author appears to have had special personal advantages. The author also gives a chapter on metallurgy in Yün-nan (containing a list of the principal mines, classified by departments), and another on trade routes, finishing with some notes on the plague, and a classified list of towns in the province, with their Chinese equivalents.

The maps are, (1) of the whole province (scale about 37 miles to the inch), compiled from all available European and native sources of information; (2) of the course and area of the plague 1871–1873; (3) a plan of Ta-li-fu and its neighbourhood, on a large scale, reproduced from a sketch by a Chinese officer, of the head-quarters of the rebels, and their works of defence.

Tobler, Titus, and Molinier, Augustus.—Itinera Hierosolymitana et Descriptiones Terræ Sanctæ Bellis sacris anteriora et latina lingua exarata. Genevæ (Fick): 1880 (on cover; 1879 on title), vol. i. pt. 2, pp. i.–lv., and 243–418. (*Williams & Norgate*: price 10s.)

Completes vol. i. of the 'Série Géographique' issued by the 'Société pour la Publication de Textes relatifs à l'Histoire et à la Géographie de l'Orient Latin (Paris: Leroux), of which the first part, by Tobler, was published in 1877.

AFRICA.

Africa.—Boletin de La Exploradora, Asociacion Euskara para la Exploracion y Civilizacion del Africa Central. Vitoria: Tomo 1, Numero 1, 15 Marzo, 1880, 8vo., pp. 64, maps.

An association under the name of 'La Exploradora' appears to have been formed so long ago as 1868, with objects similar to those now in view; this appears to have been practically dormant, but the title was revived in October 1870, since which date various preliminary publications bearing on African exploration have been issued by it (including a new project approved by "Sir Henry Stanley"). In October 1879, the present President, Don Manuel Iradier, revived the idea; and in the following month, articles of association and regulations were drawn up. The original scheme of exploration is to start from Corisco Bay, cross the Ukudi-Masei range to the volcano Onyiko, endeavour to strike the River Eyo to the north-east, and follow it to the Ogowé; then strike eastwards to Lake Mvutan, and north-east to the Kubanda and Lake Liba, following the Liba River and coming out by the Cameroons. Should the proposed expedition reach the Mvutan Lake in good condition and at a favourable season, it is proposed to travel to the south-east to the Gambaragara Mountains through Ruanda and Ankori, to visit the supposed white race living there.

These projects with their accompanying arrangements are set forth in the first number of the 'Boletín,' which also contains notes on African matters with maps not calling for special remark.

Die Karawanen-Strasse von Aegypten nach Syrien. Prag (Mercy): 1879, sq. 8vo., pp. 88, pls.

Yet another of the contributions to knowledge of the circum-Mediterranean region, originating in the artistic ability of their anonymous author (the Grand Duke of Tuscany). The present work contains twenty-three views, remarkable for effect and execution, of various localities on the road from El Kantara to Bir-el-Nus, Katia, Bir-el-Abd, Bir-el-Magara, El Harisch, Scheich-el-Zvoyed, Khanyounis, and Ghaza. The journey was made in March 1878, the author's object being to find if there still remained a land trade connection between Egypt and Syria. The steam connection between Jaffa and Alexandria has, however, apparently almost entirely superseded the old caravan route; but the author believes Beyrut to be preferable to Jaffa as a Syrian port.

Peacock, Captain George.—The Guinea or Gold Coast of Africa, formerly a colony of the Axumites or ancient Abyssinians in the reign of King Solomon, and the veritable Ophir of Scripture, now an undisputed colony of Great Britain. Exeter (Pollard) and London (Pottle): 1880, 8vo., pp. 52, maps. Price 1*s.*

The reprint of an article originally published in 'John o'Groat's Journal,' 1873, with notes, reproduction of D'Anville's map and parts of the Admiralty Survey.

Révoil, Georges.—Voyages au Cap des Aromates (Afrique Orientale). Paris (Dentu): 1880, 12mo., pp. 299, map, pls. (*Dulau*: price 3*s.* 4*d.*)

In December 1877, the author formed part of an expedition, in the ship *Adonis*, for mercantile purposes, sent out by a Marseilles firm with the original intention of following the route of the late Baron von der Decken. This, however, was abandoned, and all that could be effected was an exploration of the ports of the Benadir coast, the most northerly point of the Zanzibar dependencies, and an excursion among the Medjourtine (or Mijjertain) Somâlis, on the south of the Gulf of Aden. From Aden the expedition reached Merâya (or Muriyeh), and after visiting Alloûla (or Ulula), doubled Cape Guardafui and touched at the almost isolated Hafun, thence, travelling south, down the east coast to Brava, visiting Mogadoxo on the way. Here, in spite of authority from Seyid Bargash, permission was refused for the establishment of a mercantile depôt, and the party accordingly made a formal protest at Zanzibar, and after touching at Kismaya, Brava, and Merka, returned to France in May 1878, leaving a representative, who, it was hoped, would succeed in establishing commercial relations at the points visited. The chief obstacle to the development of the apparently considerable resources of this country is the unsettled political condition, there being no sufficient authority to put an end to the continual warfare between the Somâlis of the interior and those of the coast.

Shortly after his return to France, an opportunity occurred for a further exploration of the Medjourtine country, which had been only touched at Muriyeh on the first visit, and on arriving there a second time, war was found to be declared with the Governor of Ulula. The author ascended Gebel Karoma, near Cape Guardafui, and notes the preservation in its name of the ancient term "Regio aromatica," applied to this point of Eastern Africa. He then travelled westward along the coast, visiting Gandala, Bender Ghasim (Bossassa), and other ports, and reaching Lasgoreh, in the Warsangali or Singeli country, from which he returned to Aden. The map shows this route and also the roads from Muriyeh and Bender Ghasim inland to Karkar, and from Karkar eastwards to Hafun on the coast (these latter from native information); and the plates give outlines of the various points of importance visited by the author—a small map at page 201 also showing the country between Gandala and Bender Kor, with the old inland sea-limit.

M. Révoil devotes a special chapter to the geography, hydrography, and ethnography of the Medjourtine country, of which scarcely anything is known to geographers (but see *anteà*, p. 373). He figures the chief types of the people seen, and considers them as certainly the purest of the Somâli race, quoting also a recent letter from Colonel Playfair testifying as to their hospitality to shipwrecked crews. A list of products is given containing many of the aromatic substances from which the country received its old name, with some native commercial statistics and other useful information. At Gebel el Seghir, between Muriyeh and Gandala, the author found considerable deposits of guano.

Ricoux, R.—La Démographie figurée de l'Algérie; Étude Statistique des Populations Européennes qui habitent l'Algérie, avec douze tables graphiques traduisant les principales conclusions. Paris (Masson): 1880, 8vo., pp. 304. (*Williams & Norgate*: price 8*s.*)

AMERICA.

Le Moyne, A.—La Nouvelle-Grenade, Santiago de Cuba, La Jamaique et l'Isthme de Panama. Paris (Quantin): 1880, 2 vols. 12mo., pp. 309 and 307. (*Asher*: price 5*s*.)

The Chevalier Le Moyne, Ex-Minister Plenipotentiary, who resided in the United States of Colombia (then known as New Granada) from 1828 to the end of 1839, here describes the incidents of his travel to Sta. Martha, up the Magdalena to Mompox, Honda, and Bogotá, and enters at some length upon the political and social aspects of the country.

AUSTRALIA.

Bonwick, James.—The Resources of Queensland. London (Silver & Co.): 1880, cr. 8vo., pp. 126, map. Price 1*s*.

A more detailed and recent account of the colony than that contained in the Australian Handbook of the same publishers, but on the same instructive and easily intelligible plan. The geography, geology, and climate are separately discussed, and the map (scale 125 miles to the inch) contains the recent discoveries on the north-west, near the eastern boundary of the northern territory of South Australia.

GENERAL AND INSTRUCTIVE.

Haughton, Samuel.—Six Lectures on Physical Geography. Dublin (Hodges, Foster & Co.) and London (Longmans): 1880, 8vo., pp. 386, 23 diagrams. Price 15*s*.

Part of the Dublin University Press Series, undertaken by the authorities of Trinity College, Dublin, and forming rather a series of sketches of some important features of physical geography than a formal exposition of the subject. The lectures are (1) on the past history and future prospects of the globe; (2) continents and oceans, volcanoes and mountains; (3) climate and atmospheric and oceanic circulation; (4) rivers and lakes of "Europasia," and (5) of Africa and South America; (6) geographical distribution of animals and plants. Considerable attention is given to the question of currents and river-discharges, and many points of interest are raised in the work on these and allied subjects; the author calculates, for instance, that the rainfall of the Upper Ganges scrapes off one foot of rock from the whole surface of its rain-basin in 1146 years—an important result, if accurate, as tending to diminish the duration of geological time.

Johnston's Handbook to the Terrestrial Globe. Edinburgh and London (W. & A. K. Johnston): 1879, cr. 8vo., pp. 42. Price 1*s*.

After an explanation of the physical and mathematical components of a terrestrial globe, and of the terms employed with regard to astronomical phenomena affecting the earth, a series of problems in physical geography capable of solution by such a globe is given, with their answers and explanatory rules.

Sonklar, Carl.—Lehrbuch der Geographie für die k. k. Militär- Real- und Kadetenschulen. 1 Theil (Zweite Auflage), pp. xxii. and 362; 2 Theil (Vierte Auflage), pp. xxiv. and 363. Wien (Seidel): 1880, 8vo., diagrams.

The first part, which is chiefly introductory and general, appears not to have required so much revision as the second, which, being specially devoted to the physical and political geography of Europe, and intended for the practical instruction of the higher classes of military students, requires more working up to date.

'oung, John Russell.—Around the World with General Grant: a Narrative of the visit of General U. S. Grant, Ex-President of the United States, to various Countries in Europe, Asia, and Africa, in 1877, 1878, 1879. New York (American News Company): [1880], 2 vols. 4to., pp. 631 and 631, maps, pls., woodcuts. (*Sotheran*: price 3*l.* 3*s.*)

Only to be noted here from the fact of the salient features noticeable in a journey round the world being pictorially illustrated in one accessible work. Some few of the 800 drawings are good.

NEW MAPS.

(By J. COLES, *Map Curator* R.G.S.)

WORLD.

Hakluyt Society.—The Map of the World, A.D. 1600; called by Shakspere "The New Map, with the augmentation of the Indies." To illustrate the voyages of John Davis. Hakluyt Society, London, 1880.

This is a reproduction of the first map of the world which was published in England (1600) on Wright's projection, and which has attracted much public attention. There are many special points of interest in this map, amongst others, the fact that the knowledge of the geography of the west coast of North America was more perfect in 1600 than it would appear to have been a century later; this will be seen by comparing this map with that published in the 'Collection of Voyages,' by John Harris, F.R.S., 1705, vol. i. p. 685, in which California is laid down as a large island. So much has been written and said about this map, that it is only necessary to mention in the present instance, that the northern part, including Spitzbergen, Novaya Zemlya, and the Lapland Coast, is taken from the map drawn by Willem Barents (1599), and that it is intended to illustrate the voyages of John Davis. An indication is also given of the position of Australia, not so very far from its true position in latitude and longitude, and by a strange coincidence a large bay, somewhat resembling that into which the Victoria River falls between Cape Londonderry and Cape Ford, is shown in just such a position as a man, furnished with the imperfect instruments of the time, and with but a partial knowledge of nautical astronomy, would place it; the position given being about 300 miles in error, a distance represented by half an inch on the scale of the map, and is considerably nearer truth than the position assigned to Cape Horn on the same map.

EUROPE.

Brockhaus, F. A.—Neue Karte der Umgebung von Komotau, Brüx, Teplitz, Leitmeritz, im neuen (Meter-) Mass. 1 : 150,000 or 2 geographical miles to an inch. Gezeichnet von Reissinger. Leipzig. Price 1*s.* 6*d.* (*Dulau.*)

Denarowski, K.—Sanitäts-Karte der Bukowina, mit Commentar. 2 sheets, coloured. Price 10*s.* (*Dulau.*)

Dépôt des Fortifications.—Carte de France. Feuille 8, Tours, Poitiers, Bourges, Clermont-Ferrand. Scale 1 : 500,000 or 6·8 geographical miles to an inch. Dépôt des Fortifications, Paris. Price 1*s.* (*Dulau.*)

Franz, J.—Eisenbahn und Dampfschiffrouten-Karte von Europa. Scale 1 : 3,000,000 or 41·6 geographical miles to an inch. Flemming, Glogau. New Edition, 1880. 6 sheets. Price 6*s.* (*Dulau.*)

Handtke, F.—Post- und Reise-Karte von Deutschland und den Nachbarstaaten. Nach den neuesten und besten Quellen entworfen. Flemming, Glogau. New Edition, 1880. Folded in case. Price 6*s.* (*Dulau.*)

Masckek, R., sen^r.—Artaria's neueste Touristen-Karten, Blatt IX. Oetzthaler Ferner (südlicher Theil), Meran, Ortler-Gruppe, etc. Scale 1 : 129,600 or 1·7 geographical miles to an inch. Artaria & Co., Vienna. Price 2*s.* (*Dulau.*)

Perles.—Reisekarte der oesterreichisch-ungarischen Monarchie. Scale 1 : 2,250,000 or 30·4 geographical miles to an inch. Perles, Vienna. 10th Edition, 1880. Price 1*s.* 6*d.* (*Dulau.*)

Petermann's 'Geographische Mittheilungen.'—Die Serra da Estrella. Scale 1 : 500,000 or 6·8 geographical miles to an inch. Justus Perthes, Gotha, 1880. Petermann's 'Geographische Mittheilungen.' Ergänzungsheft No. 61.

Röttger.—Eisenbahn-Karte d. europäischen Russland. Scale 1 : 8,400,000 [illegible] 115 geographical miles to an inch. Röttger, St. Petersburg. New Edition, 1880. Price 1*s.* (*Dulau.*)

Schultz, R. & Co.—Plan der Stadt Strassburg und ihrer Erweiterungen (Bebauungs-plan). Strassburg in Elsass. Price 5*s.* (*Dulau.*)

Topographical Department, Saxon General Staff.—Karte d. deutschen Reiches. Scale 1 : 100,000 or 1·3 geographical miles to an inch. Sect. 391–394, 415–420, 441–443, 445, 446, 470. Hrsg. v. dem topograph. Bureau d. kgl. sächs. Generalstabes 1880. Kpfrst. u. color. Fol. Price of each sheet, 1*s.* 6*d.* (*Dulau.*)

Contents:—391. Oschatz.—392. Grossenhain.—393. Kamenz.—394. Milkel. —415. Borna.—416. Döbeln.—417. Dresden.—418. Bischofswerda.—419. Bautzen.—420. Ostritz.—441. Altenburg.—442. Chemnitz.—443. Dippoldiswalde.—445. Zittau.—446. Hirschfelde.—470. Sayda.

Vuillemin, A.—Bassin du Tage, du Guadiana, du Guadalquivir, du Xucar et de la Segura. Scale 1 : 2,200,000 or 29·7 geographical miles to an inch. Vuillemin, Paris. Price 1*s.* (*Dulau.*)

Wyld, J.—Parliamentary Representation 1880. Wyld's Map of the United Kingdom of Great Britain and Ireland, showing the places sending Members to Parliament, with the numbers returned, the Divisions of Counties according to the Reform and Boundary Acts of 1832 and 1868, and also the Contributary Boroughs of 1832. Scale 1 : 2,250,000 or 30·4 geographical miles to an inch. J. Wyld, London, April 24th, 1880. Price 1*s.*

ORDNANCE SURVEY MAPS.

6-inch—County Maps:—

SCOTLAND: Argyllshire, Island of Mull, No. 108, 2*s.* 6*d.*; Inverness, Island of Eigg, No. 73, 2*s.*; Inverness and Argyllshire, Island of Eigg and Island of Muck, No. 72, 2*s.*

25-inch—Parish Maps:—

ENGLAND: Cornwall: Mawgan in Meneage, 13 sheets at 2*s.* 6*d.*, Area Book 2*s.* 6*d.*; Gwinear, 12 sheets at 2*s.* 6*d.*, Area Book 2*s.* 6*d.*; St. Keverne, 22 sheets at 2*s.* 6*d.*, Area Book 4*s.* Herts: Hemel Hempstead, 2 sheets in completion, at 2*s.* 6*d.* Notts: Annesley, 10 sheets, 9 at 2*s.* 6*d.*, 1 at 4*s.*, Area Book, 1*s.* Oxford: Burcott, 1 sheet in completion, at 2*s.* 6*d.*; Clifton Hampden, 1 sheet in completion, at 2*s.* 6*d.*; Nuneham Courtney, 2 sheets in completion, at 2*s.* 6*d.*

SCOTLAND: Argyll: Colonsay and Oronsay, 3 sheets at 2*s.* 6*d.*, Area Book 1*s.*; Kilfinichen and Kilvicuen, 18 sheets at 2*s.* 6*d.*, Area Book 2*s.*; Kilninian and Kilmore, 25 sheets at 2*s.* 6*d.*, Area Book 2*s.* 6*d.*

Town Plans—10-feet Scale:—

ENGLAND: Berks: Reading, 2 sheets in completion, at 2*s*. Derbyshire: Buxton, 7 sheets in completion, at 2*s*. Herts: St. Albans (in part), 15 sheets at 2*s*. Stafford: Kidsgrove, 6 sheets, at 2*s*.

5-feet Scale:—

SCOTLAND: Edinburgh, No. 30 *revised*, 2*s*. (*Stanford, agent.*)

ASIA.

Palestine Exploration Fund.—Map of Western Palestine, in 26 sheets; from Surveys conducted for the Committee of the Palestine Exploration Fund, by Lieutenants C. R. Conder and H. H. Kitchener, R.E., during the years 1872–1877. Scale 1 : 63,360 or 1·1 inch to a geographical mile. Photozincographed and printed for the Committee under the superintendence of Lieutenant-Colonel Carey, R.E., at the Ordnance Survey Office, Southampton, Colonel Cooke, C.B., R.E., director; by permission of the First Commissioner of H.M. Works. E. Stanford, London, 1880. Price 3*l*. 3*s*.

This map is a photozincograph, coloured, on 26 sheets; the country included extends from lat. 31° 12′ N. to lat. 33° 20′ N., and from the Mediterranean Sea to the River Jordan, the Sea of Galilee and the Dead Sea. An Index Map is given, which, in addition to an explanation of signs used in the map, contains a list of seventy-seven topographical and geographical terms in Arabic. At present but a limited number of copies of this map have been published, and it is probable that some weeks may elapse before the publication of the edition is completed; but those who desire to possess a copy of the map can have one by leaving an order for it at Mr. Stanford's Geographical Establishment, 55, Charing Cross.

Surveyor-General of India.—Map of the Seat of War in Northern Afghanistan; taken principally from Surveys and Reconnaissances by Officers of the Survey of India, 1878–79–80. Scale 1 : 253,440 or 3·4 geographical miles to an inch. Published under the direction of Major-General J. T. Walker, C.B., R.E., F.R.S., Surveyor-General of India. Surveyor-General's Office, Calcutta. Price 4*s*.

The area covered by this map is very nearly the same as that included in a map published by the same Department in 1879, entitled "The two Routes to Kabul, viâ Jalalabad, and viâ the Kuram Valley"; there is, however, in the present map an extension to the north and west of 30 miles, and on the east it is contracted 25 miles. The two principal routes to Kabûl have, in this map, received very important additions and corrections; the Kuram Route takes in many places an entirely different direction from what has hitherto been laid down, and an affluent, not named, but nearly as large as the main river itself, is shown as flowing into the Kuram River between Fort Kuram and Chapori. On the Jalalabad Route, the most noticeable correction is between Hashim Khel and Lataband Kotal; while the Route from Charasia to Kabul on this map is entirely different from that previously laid down, passing through the valley of the Logar opposite to Saak, and so on to Kabul by Beni Hissar, Kalacha, and the Bala Hissar. To the north the course of the Kabul River and some of its affluents have received extensive corrections, and indeed the alterations of, and additions to the topography of this portion of the map are too numerous to mention in a notice of this description. On an inset map there is given the continuation of the Panjshir Valley. The result of recent surveys is distinguished from portions taken from old and extraneous sources (which are only approximate) by the system of hill shading; the new work being drawn in horizontal, and the old in the vertical style.

Surveyor-General of India. — Map of country between Kalat-i-Ghilzai and Ghazni, in continuation of the 'Map of the Seat of War in Northern Afghanistan,' 1880. Compiled from 'Reconnaissance of Country in the Tarnak Valley by

Major W. M. Campbell, R.E., Deputy Superintendent, Survey of India, and Captain E. H. Sartorius, 59th Regiment,' and from the Map of Afghanistan by Major C. W. Wilson, C.B., R.E., War Office, London. Scale 1 : 253,440 or 3·4 geographical miles to an inch. Published under the direction of Major-General J. T. Walker, C.B., R.E., F.R.S., Surveyor-General of India. Surveyor-General's Office, Calcutta, April 1880. Price 3s. ,

This map is a continuation to the south-west of the 'Map of the Seat of War in Northern Afghanistan.' It contains numerous corrections and additions.

AFRICA.

Petermann's 'Geographische Mittheilungen.'—Junker's Reisen in N. [illegible] C. Africa. Blatt. 3. Die Ruinenfelder u. d. Natron-Thal im Nordöstl. [illegible] der Lybischen Wüste. Nach Dr. Junker's Tagebuch gez. v. B. Hassenstein. [illegible] in. Scale 1 : 1,000,000 or 13·6 geographical miles to an inch. Justus Perthes, Gotha, [illegible] 1880. Petermann's 'Geographische Mittheilungen,' 1880. Taf. 9. (*Dulau.*)

AMERICA.

Petermann's 'Geographische Mittheilungen.'—Karte von Süd-Chile: Provinz [illegible] Llanquihue und Theile von Valdivia und Chiloe. Nach Francisco Vidal Gormaz [illegible] u. A. sowie nach eigenen Forschungen bearbeitet von C. Martin. Scale [illegible] 1 : 1,200,000 or 16·3 geographical miles to an inch. Justus Perthes, Gotha, [illegible] 1880. Petermann's 'Geographische Mittheilungen,' 1880. Taf. 8. (*Dulau.*)

Brochet e hijo.—Mapa historico-geografico de la America del Sur, 1880. Cos-[illegible] truido en Sud-America, segun documentos oficiales, exploraciones propias y los [illegible] ultimos mapas parciales aprobados por los gobiernos de las respectivas naciones, por [illegible] el ingeniero P. Brochet e hijo. Paris, Becquet. 2 sheets. (*Dulau.*)

CHARTS.

Admiralty.—Charts published by the Hydrographic Department, Admiralty, in [illegible] in March and April, 1880.

No.	Size.		Inches.	
2242	m	=	1·3	Marmara sea:—Marmara island and Pasha Liman group. Price 1s. 6d.
37	m	=	2·0	China, Hainan island:—Hoi-how bay. Price 1s. 6d.
1611	m	=	2·5	Adriatic sea:—Ports and anchorages in Dalmatia. Price 1s. 6d.
1610	m	=	0·5	England, east coast:—North Foreland to Orfordness, including the entrance to the Thames. Price 2s.
1697	m	=	0·9	Africa, west coast:—Garraway point to Growa point, including cape Palmas. Price 1s. 6d.
1364	m	=	0·25	Africa, west coast:—Cape Mesurado to Baffou bay. (Plans, Junk river. Edina and Bassa. Cestos bay. Monrovia bay.) Price 2s.
1365	m	=	0·25	Africa, west coast:—Baffou bay to Grand Bereby, including cape Palmas. (Plans, Sinou bay. Sangwin river. Tabou to Wappoo. Poor river to Katum rock. Tabou river.) Price 2s. 6d.

No. 769. Plan added, St. Andrew anchorage. No. 2736. Plan added, Veráwal roads. No. 347. Plans added, Approaches to Pioneer river. Beverley islands anchorage.

CHARTS CANCELLED.

No.		Cancelled by	No.
2242	Rhoda channel and anchorage	New plan, Marmara island and Pasha Liman group	2242
1611	Valle Grande	New sheet, ports and anchorages in Dalmatia	1611
1616	Curzola channel		
1649	Lago and Rosso ports		
1610	Thames entrance	New chart, North Foreland to Orfordness	1610
1697	Cape Palmas and Tabou river	New plan, Garraway point to Growa point	1697
1690	Gallinas; Monrovia bays, &c.	New chart, Cape Mesurado to Baffou bay	1364
1365	Cape Mesurado to cape Palmas	New chart, Baffou bay to Grand Bereby	1365

CHARTS THAT HAVE RECEIVED IMPORTANT CORRECTIONS.

No. 2172. Arctic sea:—Behring strait. No. 2149. Eastern archipelago:—Gaspar and Banka straits. No. 1664. Mediterranean:—Port Iero or Olivieri. No. 2328. Norway, sheet 2:—Christiansand to Sandö. No. 2306. Norway, sheet 4:—Romsdal islands to Hitteren island. No. 2307. Norway, sheet 5:—Smöelen island to Svee fiord. No. 2308. Norway, sheet 6:—Brand fiord to Lekö. No. 2310. Norway, sheet 8:—Donnæso to Fleina. No. 2311. Norway, sheet 9:—Fleina to Vest fiord and the Lofoten islands. No. 2312. Norway, sheet 10:—Lofoten islands to Andö. No. 2314. Norway, sheet 12: — Helgö to Sörö. No. 2316. Norway, sheet 14:—North cape to Tana fiord. No. 2317. Norway, sheet 15:—Tana fiord to Veranger fiord. No. 274. North Polar chart, Atlantic side. No. 278. North Polar chart, Pacific side. No. 2282. Arctic ocean and Greenland sea. No. 1319. South America, west coast: — Concepcion bay. No. 2822. France, south coast: — Ports Cannes and Antibes, Jouan gulf. No. 2607. France, south coast:—Marseille to Hyères. No. 521. Magellan strait: —Plans of ports. (*J. D. Potter, agent.*)

Dépôt des Cartes et Plans de la Marine.—No. 3622. Plan des Environs de Trouville, 1878. No. 3694. Côtes Ouest de France, Baie de la Rochelle, 1879. No. 3661. Côtes Ouest d'Écosse et Iles adjacentes, de l'Isle Rum à la Pointe Greenstone, 1879. No. 3662. Côtes Ouest d'Écosse et Iles adjacentes, entre la Pointe Greenstone et le Cap Wrath, 1879. No. 3669. Côtes Ouest d'Écosse et Iles adjacentes, du Sound du Jura à l'Ile Rum, 1878. No. 3658. Mer Baltique, Entrée du Golfe de Finlande, de l'Ile Œsel à Port Baltik, 1878. No. 3676. Mer Méditerranée, Malte, Plan des Ports de la Valette, &c., 1879. No. 3678. Carte Générale de la Côte de l'Algerie (1ère Feuille) d'Alger à la Frontière du Maroc, 1879. No. 3716. Chypre (Côte Est), Famagouste, 1879. No. 3688. Mer Ionienne, Ithaque, Golfe de Molo et Port Vathi, 1879. No. 3629. Ports et Mouillages à la Côte Sud de Nipon, Baie Kada, Taize Ura et Baies adjacentes, 1878. No. 3706. Japon, Côte Est de Nipon, Plans des Baies de Odzutsu et Kamaishi, 1879. No. 3718. Japon, Côte Sud de Kiusiu, Golfe de Kagosima, Partie Supérieure, 1879. No. 3664. Japon, Côte Sud de Nipon, entre le Chenal Kii et la Baie Owasi, 1878. No. 3679. Japon (Côte Sud du Nipon), Ports de Mura et de Goza, 1878. No. 3536. Tong-Kin, Reconnaissance du Lach-Day, entre Phu-Ly et le Song-Ca, 1877. No. 3714. Golfe du Tong-Kin, Plan des Iles Gow-Tow, Archipel des Fitze Long, 1879. No. 3721. Golfe du Tong-Kin, Plan du Cap Cua-Lam, &c., 1879. No. 3727. Golfe du Tong-Kin, Plan du Cap Pac-Lung et de la Baie de Oanh-Xuân, 1879. No. 3710. Côte Orientale de la Chine, Plan des Chenaux entre l'Ile

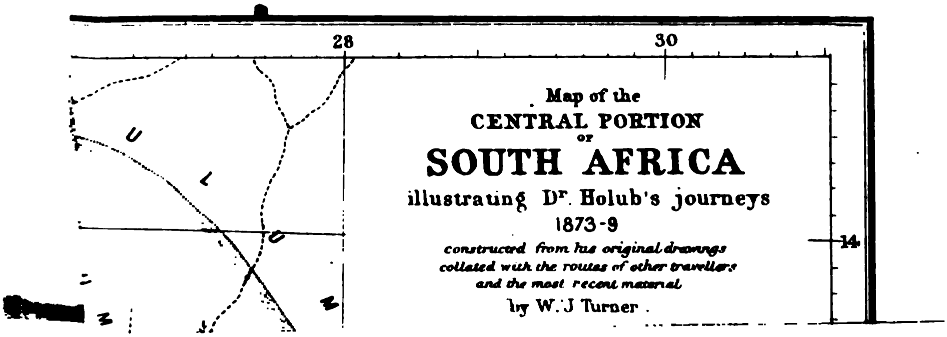
Yit Rouge et l'Ile Rugged entrée Sud du détroit de Hai-Tan, 1879. No. 3705. Côte Nord-Est de la Chine, Carte du Cap Chantung, entre les Iles Miau-Tau et la Baie Kyau-Chau, 1879. No. 3703. Mer de Behring, Iles Aleoutiennes, 1879. No. 3715. Golfe du Bengale, Côte d'Orissa, Mouillage de False Point et Entrées de la Crique Bacood et des Rivières Jumboo et Mahanuddy, 1879. No. 3692. Détroit de Malacca, Péninsule Malaise, Iles et Chenal Dinding, 1879. No. 3724. Croquis du Mouillage de Pondichery, 1879. No. 3712. Côte Orientale d'Afrique, Port de Zanzibar et ses approches, 1879. No. 3702. Côte Orientale d'Afrique, Ile et Chenaux de Zanzibar, 1879. No. 3696. Iles du Cap Vert, Ile S^n Nicolao, 1879. No. 3701. Golfe de California, Ile Angel de la Guardia, Puerto Refugio, 1879. No. 3707. Amérique du Sud, Canaux Latéraux, Baie Tom, Port Simpson, 1879. No. 3709. Amérique du Sud, Canaux Latéraux, Havre Mayne, 1879. No. 3706. Chili, Rade de Algarrobo, 1879. No. 3700. Chili, Port Tongoy, 1879. No. 3689. Océan Pacifique Nord, Iles Palau, 1879. No. 3693. Océan Pacifique Sud, Ile Tonga-Tabu, Plan de la Partie Nord, 1879. No. 3699. Océan Pacifique Sud, Iles Norfolk et Philip, 1879. No. 3704. Océan Pacifique Sud, Groupe Kermadek, Ile Raoul ou Sunday, 1879. No. 3691. Océan Pacifique, Nouvelle Calédonie, Partie Ouest de Kunie (Ile des Pins), 1879. No. 3687. Mer des Indes, Port Louis (Ile Maurice), 1879.

Royal German Admiralty. — Seekarten der Kaiserl. deutschen Admiralität, herausgegeben vom hydrograph. Amt. No. 30. Ostsee. Deutsche Küste. Schleswig-Holstein, Sect. II. Scale 1 : 100,000 or 1·3 geographical mile to an inch. Vermessen im Jahr 1872. No. 65. Ostsee. Deutsche Küste. Pommern, Sect. V. Scale 1 : 150,000 or 2 geographical miles to an inch. Vermessen im Jahr 1878. D. Reimer, Berlin. Price 2*s.* 6*d.* each. (*Dulau.*)

U.S. Hydrographic Office.—Chart No. 866. Mona Island. From a Survey by the Officers of the Royal Spanish Steamer *Bazan*, under orders of Com^re D. Nic. de Manterola, 1858. Published March 1880 at the Hydrographic Office, Washington. D. C. S. R. Franklin, Captain U.S.N., Hydrographer to the Bureau of Navigation. Price 3½*d.*

EDUCATIONAL.

Larochette & Mayer.—Grand planisphère terrestre à l'usage des écoles, des colléges et des lycées. Larochette & Mayer, Paris. 4 sheets, coloured. Price 10*s.* (*Dulau.*)



Map of the
CENTRAL PORTION
OF
SOUTH AFRICA
illustrating Dr. Holub's journeys
1873-9
constructed from his original drawings collated with the routes of other travellers and the most recent material
by W. J Turner.

PROCEEDINGS

OF THE

ROYAL GEOGRAPHICAL SOCIETY

AND MONTHLY RECORD OF GEOGRAPHY.

The Annual Address on the Progress of Geography.

By the Right Hon. the EARL OF NORTHBROOK, First Lord of the Admiralty, PRESIDENT.

(Delivered at the Anniversary Meeting, May 31st, 1880.)

THE PRESIDENT addressed the Meeting as follows :—

I have on the present occasion to solicit your indulgence because, having been much occupied lately in other affairs, I have not been able to give all the attention I could have wished to the preparation of the Address on the progress of geographical discovery during the year which is customarily given by the President at the Anniversary Meeting. I will proceed, however, without further preface, to lay before you such observations as I have been able to put together, on the subjects that appear to me to be of chief interest.

The general progress of the Society during the past year has been described in the Report of the Council, but I may briefly notice, with satisfaction, the promise of success which attends a measure that was adopted soon after I became President. I allude to the scheme for giving practical instruction to intending travellers in the use of instruments and in surveying. The result of this attempt to improve the scientific training of travellers is encouraging, and several pupils have received instruction before undertaking journeys to unknown or little-known parts of the world. There is every reason to expect that the system will bear valuable fruit hereafter, and that many travellers will receive suitable training for their work, and thus very materially increase its value.

It has been, as you are aware, the custom in these Addresses to embody notices of the deaths of distinguished Fellows of the Society. This year and last, in accordance I think with a general desire on the part of the Fellows, the Address of the President has been much shortened, and a large part which used to be included in the Address itself is now added in the form of appendices. It has been thus with regard to the Obituary. A record of the Fellows who have died during the past year, prepared by the Assistant Secretary, will appear as an appendix to my Address. But some of our deceased Fellows were so eminently distinguished by their services, in one department or another, that it would not be right for me to omit special notice of them on the present occasion. Two of these were well-known geographers connected with the Society. One, Mr. R. B. Shaw, was a Gold Medallist, whose travels in Kashgar and the neighbouring countries obtained for him a wide reputation, and who served the Government of India, when I had the honour of being connected with that country, in posts of great responsibility, losing his life at last in the performance of his duty as Resident at the Court of Mandalay. His career was described by me at some length at one of our evening meetings; but I cannot avoid on this occasion renewing my testimony to his high merits both as a geographer and as a public servant. The second was one of the most distinguished young geographers of the present day, Mr. Keith Johnston, who as you know died in charge of the expedition which had been sent by the Royal Geographical Society to Lakes Nyassa and Tanganyika. Mr. Keith Johnston was commencing his practical work of exploration; but although he has lost his life in the service of geographical discovery, he has left behind him, as many of you are aware, works of the highest interest and importance, which have been recently given to the world. His volume upon Africa, and his general work on Geography, which have been recently published by Stanford, are, I believe, some of the best geographical works that have been produced for many years. Turning from those whom we lament as being more especially connected with geographical exploration, to others whom we have seen among us as Fellows of the Society, there are some that I am bound to mention. On the list is the name of one who was well known in the political world before the Reform Bill of the year 1832, as a man of great promise and distinction, and of high honour and integrity—I mean Sir Richard Vyvyan—who, besides his eminence in the political world, had a high scientific reputation. Although he had not made his appearance in the metropolis during the latter part of his life, living as he did in retirement in Cornwall, he has left among those who knew him—and I have met several of them—a reputation for great ability. Another man of eminence has passed away, whom we have seen among us in London constantly—Sir John Shaw Lefevre—a distinguished mathematician, Senior Wrangler at Cambridge, one of those men who, though not very prominently before the public, have often done more real service to their country than those whose names are more bruited in the arena of political strife.

'or many years he was one of the permanent secretaries of the Board f Trade, and his well-known face was seen afterwards at the table of he House of Lords, where he was Clerk of Parliaments. He was nuch beloved in private life, and a man of high literary and scientific nowledge. There has passed from among us also another man of onsiderable political distinction—Lord Hampton—who was known so ong in the House of Commons as Sir John Pakington, filling with redit and ability high offices of State, and taking a leading part in very matter in which the welfare of his fellow-countrymen was concerned, and particularly in the encouragement of education. We have, astly, lost a man who had a still wider reputation in Lord Lawrence, vho showed throughout all his career to what high-distinction the imple, honest, energetic performance of duty will lead a man. Having ccupied the highest positions in the civil service of India, having been ne of the foremost to restore the Empire at the time of its greatest eril, he filled for five years with great advantage to India the office of overnor-General, and on his return to this country showed, by his cceptance of the chairmanship of the London School Board, and other luties of a similar character, that he was desirous to the best of his bility, and to the end of his life, to continue that simple life of duty vhich was his distinguishing characteristic.

Turning to the main subject of this Address, the most important eographical achievement of the year is undoubtedly the completion of he North-East Passage by Professor (now Baron) Nordenskiöld. The reat merit of this feat is the far-seeing sagacity with which the plan of ction was carefully thought out in every detail. So admirably were ll the preparations made, and the best way of meeting difficulties nsidered, that chance scarcely entered into the calculations of the reat Swedish explorer. The *Vega* did not sail until her leader had nade two personal reconnaissances, and had carefully weighed the bearngs of all existing information. It was the merest accident that revented the North-East Passage being effected in one year, instead f the ship being detained, as it was, till the beginning of the next year.

No explorer more fully deserved the great success which has attended is efforts; and he and his gallant followers have received the warmest ongratulations from the geographers of all civilised nations. Professor ordenskiöld and his gallant companions have been received with acclamation wherever they have appeared, and the only thing I have to egret is that his visit to this country happened at a time when it was mpossible for us to do him the honour that we had intended and prepared for him. As soon as I heard of his expected arrival, I thought, n behalf of the Royal Geographical Society, that I was right in asking is Royal Highness the Prince of Wales to be so kind as to take he chair at a banquet which we proposed to give him. His Royal ighness at once, and with the greatest cordiality, acceded to my request, and every preparation was made for the dinner, when unfortunately that great annual annoyance in this country, the east wind, which prevailed at that time, prevented the *Vega* coming up the Channel, thus delaying the arrival of Professor Nordenskiöld for a week, and upsetting all our arrangements. One of our other periodical epidemics, the General Election, took place at the same time, and it was, in consequence, absolutely impossible to bring together a number of people sufficient to make it worth while to ask Professor Nordenskiöld to a banquet when his arrival, on Good Friday, was at length announced. But however much we may regret that we were unable then to entertain the explorers, some delay may not ultimately be a disadvantage to the interests of geography, because, putting aside our desire to compliment a great explorer, it would not have been easy for Professor Nordenskiöld at that time to have entered as fully as he would have wished into what is really the important matter for the interests of geography, namely, the commercial results which may be expected to follow from the voyage of the *Vega*, and the lessons which may be gained from it in respect to the application of further exploration and discovery in those quarters. Professor Nordenskiöld, with whom I was in communication when he was in England, thought that some time had better elapse before he addressed a meeting of the Society, so that he might be able to bring together carefully his views of the results of the expedition, and invite a discussion in the place, which I, without presumption, may say is almost the centre of the geographical world.

I had a letter from Professor Nordenskiöld the other day, in which he expressed his great regret at not being able to attend our Anniversary Meeting, part of which I should like to read to you. He says:—"Unfortunately I am at present so engaged in arranging the collections brought home by the *Vega* expedition, in preparing the publications, in private business, in practical consultations for opening up trade on the Siberian rivers, and, worst of all, in answering hundreds of letters arrived during an absence of nearly two years, that it is impossible for me to leave Stockholm during several months. I especially regret not to be able to partake in the discussion which it seems to be the intention of the Royal Geographical Society to propose. Would it not be advisable to postpone this discussion to the next autumn, when we shall know the results of the several enterprises of this summer?

"The steamer *Nordenskiöld* is re-equipped by Mr. Sibiriakoff in Yokohama for a voyage from Japan along the northern shores of Siberia to the Atlantic, and *I am quite persuaded that my namesake's anchor will next October be safely dropped at Tromsö or Hammerfest.* Several Scandinavian shipowners have the intention to send ships this summer to the Obi or the Yenisei, &c., &c."

Therefore, ladies and gentlemen, it appears to me probable that Professor Nordenskiöld will be able to accept the invitation which my successor will, I have no doubt, give him to attend one of the meetings of this Society in the course of the autumn. Up to the present time, from an able memorandum which Professor Nordenskiöld addressed to the King of Sweden, and of which he was good enough to give me a copy, it appears that he has arrived at the following conclusions, which I will venture to read to you. He sums up his opinion in four short sentences. He says:—

"1. The route by sea from the Atlantic to the Pacific on the northern coast of Siberia may be frequently traversed in a few weeks by a suitable steam vessel, manned by experienced sailors, but it is not likely from the acquaintance which we now have with the glacial sea of Siberia that this route will become in its entirety of substantial importance to trade.

"2. We may now assume that no difficulty exists for the utilisation as a commercial route of the sea voyage between Europe and the mouths of the Obi and Yenisei.

"3. In all probability the sea route between the Yenisei and the Lena, and between the Lena and Europe, may be also used as a commercial route, but it will not be possible to go to the Lena and to return to Europe in the same summer.

"4. Further explorations are necessary in order to decide on the possibility of opening out commercial maritime relations between the mouth of the Lena and the Pacific. The experience acquired by the expedition shows that it is possible to bring by this route from the Pacific into the basin of the Lena steam vessels, heavy engines, and other articles which cannot be conveniently transported on sledges or by wheel conveyance."

It must be obvious, from the mere statement of these results, of what great value to the commerce of Siberia and the northern part of Central Asia the voyage of the *Vega* may be. We shall watch with the greatest interest the further expeditions which have been mentioned by Professor Nordenskiöld, and we shall listen with great interest when he comes among us to expound his own views more fully developed upon this subject. Although of late years we have not supplied from this country many expeditions, or any expeditions, for the discovery of the North-Eastern Passage, yet we feel the interest in it which must be felt by all Englishmen in discoveries and adventures which have been commenced by this country. We all remember that the first man to command an expedition into those seas was an Englishman, Willoughby, who, with the whole of the crews of his two ships, perished of cold; and we also know that from the other side, by Captain Cook, an attempt was made to discover the North-East Passage in the inverse direction by Behring Strait and Siberia. Therefore we, as Englishmen, feel a deep interest in the solution of this problem, although our great Arctic explorers have in more recent years confined themselves to the North-West and not the North

East Passage. I must not, however, omit to mention the name of Captain Joseph Wiggins, who engaged in the exploration of the Kara Sea at the same time as Professor Nordenskiöld.

The examination of any part of the vast unknown region surrounding the North Pole is interesting to geographers, and discovery in this direction seems to have a peculiar fascination for maritime explorers. A year seldom passes without some effort being made to add to our knowledge in the far north. During last summer two voyages of reconnaissance were undertaken in this direction, one by the Dutch under Captain de Bruyne, and the other by our Associates, Sir Henry Gore Booth and Captain A .H. Markham, R.N. The Dutch officers actually sighted Franz-Josef Land, while our countrymen attained a remarkably high latitude at a very late period of the navigable season. I understand that, in the coming season, Mr. Leigh Smith, whose name is already honourably associated with Arctic yachting, will make a voyage of reconnaissance which, if circumstances prove favourable, may become a voyage of discovery. The American expedition, which sailed from San Francisco last year for Behring Strait, is believed to have wintered in the pack, and tidings of it may soon be expected.

I have quite recently received information that the Government of the United States have decided upon sending out another Arctic Expedition, viâ Smith Sound, under Captain Howgate. This is a project which has been some time under consideration, but has only now been matured. It is intended to make a temporary station for Arctic observation and discovery in the latitude of 81° 40′, on or near the shore of Franklin Bay. The expedition will consist of twenty-five people, who are to go up there in the *Gulnare*, a steamer of 200 tons. The proposal is that they should endeavour to push on to the North Pole by slow degrees during several seasons. The Board of Admiralty have placed at the disposal of this expedition the depôts of provisions left by Sir George Nares in Smith Sound in the years 1875 and 1876, and we shall feel an interest in seeing what our cousins on the other side of the Atlantic may succeed in doing in this matter.

Turning from the Arctic regions to another region where much geographical work remains to be done—the Asiatic continent—we find that the operations of surveyors accompanying the columns which have invaded Afghanistan have added largely to our knowledge. Not only have positions been more correctly fixed, and large tracts mapped with greater accuracy than before, but new passes have been explored, and extensive districts visited which were previously unknown to Europeans. Much of this valuable work has been already described in our 'Proceedings,' and it has been embodied on the new maps published by General Walker. It will not, therefore, be necessary for me to dwell upon the actual work at any length; but I cannot refrain from calling attention to the gallantry of the surveyors, and to the dangers and difficulties they encountered in performing their arduous tasks.

We hear of Captain Samuells calmly surveying at Ali Musjid under the fire of the enemy's guns, and of his continuing his observations after a cannon ball had passed between the legs of his plane table. It is with regret that I have to record the subsequent death of this promising officer from a fever brought on by exposure. More recently we have received accounts of the distinguished gallantry of Captain Leach, another surveyor—gallantry which won for him the Victoria Cross. He was engaged, with a small escort, in surveying on a spur of the Safid Koh Range, when he was surrounded by the enemy. A hand-to-hand fight ensued, but Captain Leach, not expecting any attack, was only armed with a pistol. Receiving, however, a rifle from a wounded Sikh, he made a brave defence, even after his arm was cut open from the elbow to the shoulder, and he brought his men away, after having with his own hand killed five of the assailants. Captain Woodthorpe has been continuously employed in the Kurram and Khost valleys. He was attacked on the Paiwar Kotal when carrying a message for Sir F. Roberts, having unexpectedly come upon a concealed breastwork, and found himself within a few paces of the enemy. His pistol stock was shattered by a bullet, and his life was saved by his pocket sketch-book, the bullet only penetrating and spoiling twelve of his sketches, and grazing his side. A few days afterwards he was shot again through the other pocket, but this time he shot his assailant right through the Koran that he was carrying, and he preserves the perforated volume as a trophy. Mr. G. B. Scott behaved with distinguished gallantry when his party was attacked in another part of the frontier. Woodthorpe, Holdich, and Martin have served through all the fighting at Kabul; Major Tanner made a daring attempt to penetrate into the Kaffir country; while Colonel Campbell and Captains Beavan, Heaviside, Rogers, Wylie, Strahan, and Gore have encountered similar difficulties in the useful work they have done in the Kabul and Candahar regions. Captain Showers, who explored the north and east boundaries of the Pishin Valley, was murdered by the Kahars in a recent skirmish. Mr. G. B. Scott from the northern side, and Captain Martin from the Kurram Valley, have successfully ascended the Sikaram Peak, 15,620 feet above the sea, the loftiest point along the ridge of the Safid Koh.

Further to the east, Colonel Tanner, after returning from his attempt to reach the Kaffir country, surveyed an area of about 2000 square miles round the Gilgit Valley, and along the course of the Hunza River, where he made a series of very beautiful sketches, which have been photographed. Some progress has also been made this year in the solution of the great geographical question relating to the course of the Brahmaputra. The exploration of the upper course of the Sanpo has been extended further eastward to a place called Gyala Sindong, a fort situated within a hundred miles of the highest point to which the Dihong has yet been ascended from Assam. In order to solve the question, Lieutenant Harman is arranging for a number of logs of timber, specially marked, to be floated down from Gyala Sindong into the Assam Valley. The intervening mountainous region is occupied by the Abors, a wild tribe, offering determined resistance to anyone attempting to pass through their country. General Walker has resumed his system of exploring through the medium of trained natives, and some useful work has lately been done in this way. Our Gold Medallist, the Pundit Nain Sing, now too old for travelling, is performing good service by instructing and training his younger successors.

The expedition to Tibet of that accomplished and persevering traveller, Colonel Prejevalsky, has for the present, according to recent news, failed in its main object of reaching Lhassa, the opposition of the Lamas to his progress southward proving insurmountable. Many months appear to have been spent by him in the remote and little-known regions to the north of the elevated and desert plateau which leads to the Tibetan capital; and, although foiled in their chief object, we may expect that so well equipped party have not been idle, but have profited by their opportunities to glean a rich harvest of scientific observations. The same cause, namely, the jealousy of the priestly governing class in Tibet proper, has led also to the failure of the Austrian Scientific Expedition, with which Count Szechenyi was associated, and to which I alluded in my Address on opening the Session in November. Turned back in his last attempt by a threat of armed resistance, Count Szechenyi finally abandoned the attempt and turned south by way of Yunnan and Burmah. He has now returned to Europe.

It was decided last year that instead of embodying the annual report which the Hydrographer of the Navy has been kind enough to furnish for the Address of the President it should be printed as an appendix to the Address. You will see on referring to the report for the present year that much useful work is in progress in various parts of the world. Thus Captain Wharton will have completed the surveys upon which he is engaged in the Sea of Marmora this autumn. In China, Captain Napier is about to commence the survey of Hainan Straits, giving access to the Treaty Ports of Hoihow and Pakhoi; and in Japan, Commander Aldrich has completed the survey of Van Diemen Straits.

But the most interesting survey operations during the past year have probably been those in South America, where Captain Maclear has completed the survey of the Trinidad Channel, adjoining the Straits of Magellan. A knowledge of this channel will, it is expected, conduce to the more secure navigation of those tempestuous seas. The colonial coast survey of South Australia is nearly completed, and that of Western Australia is progressing. The small sailing schooners employed in the

Western Pacific are doing good work among the numerous reefs and scattered islands of that sea.

It is interesting and important to know that the Telegraph Companies, and among them more especially the Telegraph Maintenance Company, of which Vice-Admiral Sir George Richards is the Chairman, are giving great assistance from their deep-sea soundings towards the acquirement of a true knowledge of the configuration of the bottom of the ocean.

The steam ships of war employed on surveying duties abroad during the past year have been the *Alert*, *Magpie*, *Fawn*, and *Sylvia*, with a hired steam vessel on the coast of Newfoundland, and, until December last, another on the coast of Queensland. Small but serviceable schooners have been employed in the West Indies, South Australia, Fiji, and the islands of the Western Pacific; another of these useful vessels is on her way to Western Australia. On the Home Station there are two steam vessels, one a sloop of war, and the other hired.

Altogether the number of *officers* of all ranks employed in these vessels is 72, and the crews 600.

The increased activity in African exploration which dates from the expeditions sent out, ten years ago, in search of Livingstone, has continued without abatement during the past year. It is now participated in by many civilised nations, and directed towards various objects, philanthropic and commercial, as well as scientific. The year has not, however, been marked by any of those great exploits in Central African discovery and travel which attracted so much public attention at former periods during the last decade. The journey across South-Central Africa from Benguela to Natal by Major Serpa Pinto, which was the last of this class, belongs to the year previous, having been completed in the spring of 1879, and recorded in the last Anniversary Address. Shortly after the termination of our Session, we were honoured by a visit from this distinguished Portuguese traveller, who then laid before us the interesting account of his travels which was published in our 'Proceedings' for last August. The full narrative of his expedition with a map, which he had intended to publish in London during the winter, has unfortunately been delayed through his illness, which compelled him to return to Lisbon in the autumn, leaving his work unfinished—a delay the more to be regretted as the work is to contain the results of the numerous series of astronomical observations taken by Major Pinto at many places on his march, the true positions of which are a great desideratum in the geography of that part of Africa.

We may claim as probably the most remarkable event in African exploration during the year, the journey across the previously unknown tract of country separating the two great lakes Nyassa and Tanganyika, accomplished by Mr. Thomson, the young geologist, who, as you are aware, succeeded to the command of our East African Expedition on the death of Mr. Keith Johnston. Nearly the whole route of our expedition, in fact, since the event which deprived it of its accomplished leader, has been through previously unexplored country, and although the skilled hand was absent who could have delineated its cartography with the requisite accuracy, we may gratefully acknowledge the clearness and excellence of the descriptions of the various districts and their inhabitants which are given in the reports of Mr. Thomson, who, as a young and inexperienced man of only twenty-one years of age, was called upon to assume the responsibilities of command almost at the commencement of the journey. Mr. Johnston died at Behobeho, about 120 miles distant by road from the coast, on the 28th of June last. After a delay of five days, the expedition resumed its march towards the interior, and on the 18th of August reached the great central plateau, 6700 feet high, across which its route lay nearly to the shores of Lake Nyassa. Mr. Thomson has given us a lucid description of the configuration of this tract of new country, nearly 400 miles in length. In approaching the shores of the lake he crossed the lofty flat-topped ridge, to which previous travellers had given the name of the Konde Mountains, and was able to ascertain the height and define the nature of this great physical feature, which viewed from a vessel navigating the lake appears like a precipitous mountain range. Thomson reached the northern shores of Nyassa on the 22nd of September, and started for Lake Tanganyika on the 28th, reaching Pambete, on the southern shores of the last-named, on the 4th of November. The width of the belt of land which separates these two great navigable lakes was found to be 250 miles. The march offered no special difficulties, although it was found that instead of a tract of level country, convenient for a portage between the lakes, the belt forms part of the great interior plateau averaging 4700 feet above the level of the sea. From Pambete, after a rest of a few days only, Mr. Thomson resumed his journey over the difficult and rugged country which forms the western side of Tanganyika as far as its drainage outlet, the Lukuga River. This he visited, and soon after crossed the lake to Ujiji, where he received fresh supplies for his large party (whom he had left in camp on the south-western shores of the lake), and then recrossed for the purpose of carefully examining the Lukuga previous to returning to the east coast by the southern end of the lake, and thence by a new route to Kilwa. His last letter, written at Ujiji on the 12th of January, informs us that he expects to reach the coast in June.

The interval between the two lakes, which may be considered the most interesting part of Mr. Thomson's journey, was crossed almost at the same time by Mr. James Stewart, of the Livingstonia Mission on Lake Nyassa, who, starting from a point 20 or 30 miles further south than Mr. Thomson, reached Tanganyika a day only after him. Mr. Stewart, I am glad to learn, secured on the shores of

Lake Tanganyika fifteen sets of lunar observations. These, when computed, will aid us in fixing the longitude of this important point in Central Africa, and thus add greatly to our exact geographical knowledge of the whole region. If to these two journeys I add the visit of Mr. Hore, of the London Missionary Society's station at Ujiji, to the Lukuga outlet, in April 1879, during which he had the good fortune to settle the much-debated question of the drainage of this great freshwater lake, by seeing the Lukuga flowing out as a swift river, I have mentioned the three chief additions to our geographical knowledge of Africa which have been made during the year.

The expeditions of the Belgian International Society now on foot in equatorial Africa are making steady progress. The leading object, as you are aware, of these undertakings is not exploration, but the establishment of centres of civilising influence and commerce at various points in the African interior. The first of these stations was founded in August last by M. Cambier, leader of the original expedition, at Karema, on the eastern shore of Lake Tanganyika, about 140 miles south of Ujiji. M. Cambier was joined by Messrs. Popelin and Carter, with the Indian elephants (one only of which remained), in December. Another reinforcement (the fourth expedition), under Messrs. Burdo, Roger, and Cadenhead, was far on its march when last heard of in February. So far the operations of the Society on the eastern side of Africa: on the western side great efforts are being made by the expedition under the charge of Mr. H. M. Stanley to overcome the difficulties of the ascent of the Congo; the aim being to carry steam launches in sections along the rugged banks of the river, past the long series of falls and rapids to the navigable waters of the upper river. This accomplished, few difficulties remain in the way of reaching Nyangwé, whither, according to the last reports, a portion of the Tanganyika party are about to proceed.

Incidentally, much new and valuable information has been gleaned by the various parties sent out by the International Society, not only in geography but in other branches of science. We owe, for instance, to Dr. Dutrieux, a member of the first expedition, compelled on account of ill-health to return to Europe, an excellent treatise on the endemic diseases of Eastern Africa, and on the acclimatisation of Europeans in that region. Much has been added also to the geography of the whole eastern interior along the lines of route of the various parties, and especially of the section lying between Mr. Stanley's route, to the southwest of Unyanyembe, and the shores of Lake Tanganyika at Karema. The latitude of the latter place has been fixed by the observations of M. Cambier at 6° 47′ 50″ S.

In other parts of the equatorial lake region there is little to record of direct additions to our geographical knowledge. I have already alluded to the important observations of Mr. Hore, with regard to the Lukuga outlet. The missionary party to which he belongs have since established a new station across the lake, at Mtowa, in a district of much geographical interest, and of great beauty and fertility. New boats have been built, and this remote fresh-water sea, stretching nearly 400 miles from north to south, through the heart of Africa, is now frequently navigated by the members of the party. In addition to the Belgian station at Karema, we have recently learnt that the German African Society are also sending out a party to found a similar settlement on the south-eastern shores of the lake, the Society having devoted to the expense of the undertaking the results of last year's public subscription in Germany, amounting to 16,000 marks, to which the King of the Belgians has added a contribution of 40,000 francs. The French Expedition, supported by a munificent grant from the French Chambers, has come to a termination for the present by the death of its energetic leader, M. Debaize, at Ujiji, on the 12th of December. With regard to the Victoria Nyanza, you have had an opportunity of learning what has been recently done by the Church Missionary Society party at Uganda, on the north-western border of this great lake, from the lips of two members of that Mission who read papers to the Society at one of our recent meetings. The Rev. C. T. Wilson, who has made a longer stay in this interesting region than any other European, and has frequently navigated the lake in various directions, gave us on that occasion a brief account of the country of Uganda and its people, and Mr. Felkin described the remarkable journey of the party on their return to Egypt by land, through the countries of the Upper Nile, the obstruction of the river by the frequently recurring dense growth of aquatic vegetation having rendered it impossible to descend by boat. Mr. Wilson will probably be induced soon to give to the world a fuller account of his experiences in the countries bordering the great lake, which, after much controversy, seems now admitted to be the chief source of the Nile. Mr. Felkin, one of the very few Europeans who have had the good fortune to visit both the Albert and the Victoria lakes, may also be able to enlighten us with regard to the true relation which these great reservoirs bear to each other, and to the Nile.

In Western Africa, besides the International Expedition under Mr. H. M. Stanley, there are two English missionary parties working towards the Upper Congo, one under Mr. A. McAll, sent out by the "Livingstone (Congo) Inland Mission," and another under the Rev. Mr. Comber, of the Baptist Missionary Society. Both gentlemen have had lessons in the use of instruments, under the system of scientific instruction recently established by our Society, and will no doubt add much to our geographical knowledge when they reach the remoter districts. At present Mr. Comber, who has been refused the road viâ Makuta, is trying to reach Stanley Pool by the somewhat circuitous route of Zombo: Mr. McAll's intention is to try the northern side of the Congo. The Portuguese Expedition, under Messrs. Capello and Ivens, returned to Lisbon in December last, with a rich harvest of scientific observations, having explored, since Major Serpa Pinto separated from them at Bihé, the region of the Middle and Lower Quango, and other portions of the interior drained by the great southern tributaries of the Congo. In the same region the numerous skilled travellers sent out during the past few years by the German African Society have contributed greatly to extend our knowledge of this vast extent of imperfectly known country, extending from the Quanza to the distant capital of the renowned potentate the Muata Yanvo; one of these travellers, Dr. Buchner, the last sent out, is now engaged in working his way from the Portuguese settlements eastward towards Lunda. Further north, the distinguished French traveller, M. Savorgnan de Brazza, is making a second journey to the upper waters of the Ogowé, having been charged by the French African Committee with the mission to found a civilising station at some favourable point in the western interior of the continent, in co-operation with the Belgian International Society. He left Europe for the purpose in December last. The French Government made a grant of 22,000 francs towards the expenses of this expedition. The recent explorations in the Niger system are the last to which it is necessary to allude in reviewing geographical progress in Western Africa. A paper on this subject was read at our meeting of the 22nd of March by Mr. Edward Hutchinson, giving an account of the voyage up the River Binué of the missionary steamer *Henry Venn*, which ascended to a much higher point than had yet been reached by Europeans, and added 140 miles to our knowledge of the course of the river. The paper was illustrated by an excellent chart of the new portion of the river, drawn during the voyage by Mr. Flegel, a member of the expedition.

Between the upper course of the Binué visited by the *Henry Venn* and the great northern bend of the Congo, delineated by Mr. Stanley, there remains a vast tract of Central Africa still totally unexplored, its boundaries on the west being the hills forming the watershed of the Ogowé, and on the east the country explored by Schweinfurth to the west of the White Nile. This *terra incognita* has proved to be quite inaccessible from the settlements on the west coast at Calabar, and in Loango, and the approaches to it by way of the Upper Nile are full of difficulties; the experienced Saharan traveller, M. Gerhard Rohlfs, conceived, therefore, the bold idea of reaching it from the north. I have already, in the remarks made on opening the present Session, alluded to this expedition; it must suffice now to record that M. Rohlfs having been driven back and plundered by the fanatical Suia tribe of the Kufara oasis, at a time when he was preparing to march forward to Waday, has finally abandoned the attempt as impracticable, and returned to Germany. His scientific assistant remains behind, intending, on the receipt of further supplies from Berlin, to make a fresh start viâ Bornu and Lake Chad.

In South-Eastern Africa some additions have been recently made to our knowledge by the Rev. Chauncy Maples and other members of the Universities' Mission, who have made excursions of considerable extent in the neighbourhood of their station at Msasi, north of the Rovuma. The Sultan of Zanzibar, who has recently hoisted his flag on this river, which forms the southern boundary of his dominions, sent last summer a boat expedition to ascertain the practicability of reaching by water the extensive coal-fields on the banks of the Liende, a tributary of the Rovuma, with the result of proving that this river is useless for the purposes of navigation. Some parts of the country, however, according to the interesting account given us by Mr. Maples, are fertile and salubrious, and the whole district promises to become at no distant day of much commercial importance.

In Southern Africa, where there is now but little unexplored territory left for geographical enterprise, a new interest has been given to the interior region lying between the Diamond Fields and the Zambesi, by the zeal and eloquence of the young Bohemian traveller Dr. Holub, who has twice appeared before us during the present season, and gratified us with an account of the varied regions and peoples he lived amongst during his seven years' wanderings. Although unprovided with instruments to enable him to make exact observations, Dr. Holub has contrived, by indomitable patience and industry in jotting in his field-books the bearings and configuration of country on each day's march, to bring back a vast amount of new and interesting geographical information. This has been embodied in the map which is published in the June number of our 'Proceedings.'

The name of *Henry Venn*, so appropriately given to a missionary steamer, reminds me of a subject to which I wish briefly to allude. I have seen with very great regret a pamphlet in which it is asserted that in one of the missionary stations in Africa the treatment of natives has been by no means satisfactory. The pamphlet that I have read is evidently an *ex-parte* statement of the case, and it is impossible for me to express an opinion upon the truth or otherwise of the charges. All I would say is that nothing in my opinion could be more entirely alien to the feelings of Henry Venn—who of all men I ever knew was the most interested in missionary work, and the wisest conductor of missionary operations—than that missionaries of any kind should be betrayed into using physical force to control the natives of the country to which they are sent. Missionaries must be prepared if they go to foreign countries to carry their lives in their hands. They have lost them on former occasions, and it is needless for me to say a man in that position, taking the message of the Gospel to the natives of Africa, is bound to lose his life rather than to offer physical force in his own defence.

Colonel Gordon, who stayed a short time in England between the termination of his service in Egypt and his departure for India, made to me a suggestion which I may allude to here as one of some consequence. He thought it very advisable that the Sultan of Zanzibar should select some Englishman in whom he has confidence, and give him some kind of jurisdiction over those outlying parts of the country over which the Sultan claims authority, in order that he might exercise some control over Europeans who may now be expected to travel in very much greater numbers in the interior. Colonel Gordon suggested, in point of fact, that this officer, whoever he might be (and his selection he would leave entirely to the Sultan of Zanzibar), should fill a position somewhat similar to that which Colonel Gordon himself filled on the confines of Egypt. He evidently felt considerable apprehension, and I am afraid there is some ground for it, that what we may call filibustering expeditions may be started into the interior of Africa, and that in some cases the conduct of Europeans may not be creditable or conducive to the civilisation of Africa.

In other parts of the world there is little to record in the way of geographical discovery. The most important journey is probably the expedition of Mr. Alexander Forrest in North-Western Australia, which has yielded abundant fruit in the discovery of a large extent of new and fertile country, besides the settlement of a number of geographical questions. Many explorations of minor extent have also been successfully carried out in the same continent, and some interest has been excited by the supposed discovery of traces of one of the survivors of the ill-fated Leichhardt Expedition of 1848 who had been living till recently with a tribe in the centre of Australia. Our Associates, Mr. E. W. Lamb, of Brisbane, and Mr. Eccleston Du Faur, of Sydney, who have obligingly communicated all details to us, are now engaged in endeavouring to recover the papers of this supposed survivor, who is recently dead. In South America, Mr. E. Whymper has succeeded in ascending Chimborazo and other famous peaks in Ecuador, and we have had an excellent account from Mr. im Thurn of his recent journeys in the interior of British Guiana. I must not omit to mention, before I conclude, the graphic description which Mr. Wilfred Blunt has given us, this Session, of his journey in Central Arabia, which gave us much information regarding the caravan roads and the present state of the country; and the considerable additions made to our knowledge of China by Mr. Colborne Baber, Mr. MacCarthy, Mr. Morrison, and others.

Having thus briefly alluded to the geographical events of the year, so far as I am able to describe them, I must in conclusion express my great regret that I feel it my duty to resign the office of President of the Royal Geographical Society. My reasons, I am sure, will be obvious to all of you. Having had the honour of being placed in a position of considerable labour and responsibility, it would be impossible for me to attempt adequately to perform the duties of President of this Society in addition to heavy official work. Although I do not pretend to any scientific knowledge of geography, or to place myself for a moment in comparison with those who have filled the office of President of this Society with such distinction as Sir Roderick Murchison and Sir Henry Rawlinson, I will venture to say that there is no man who has filled the office who has felt a deeper interest in the success of the Royal Geographical Society. I expressed at the time when you were good enough to choose me to fill the office, how much I felt my defects, and the imperfections which I might show in the performance of the duties; and if I have been able at all to discharge those duties to your satisfaction, it is entirely owing to the assistance which I have received from the members of the Council of the Society, from the Honorary Secretaries, and the Assistant Secretary. I desire to say lastly that I feel satisfied that you could not have made a better choice for the interests of the Society than in the selection of my successor, Lord Aberdare, to be your President. You know him well as a supporter of the Society, who has assisted you once or twice in times when assistance was necessary; and I can say that, having known him intimately for many years in political life and in the House of Commons, I am convinced that from his knowledge of business and his high literary and intellectual qualifications, he is eminently suited to fill the office to which you have nominated him to-day.

Before I sit down I should be omitting a pleasing task if I did not record again, as those who have filled the position which I now fill always have recorded, my sense of the courtesy of the London University in allowing us the use of this hall, without which the papers, written by those who have interested us during the past year, would not have found a suitable place wherein they could be read and discussed.

OBITUARY FOR THE YEAR 1879–80.

We have to regret the loss by death this year of no fewer than sixty-seven Fellows. In accordance with the procedure established on the commencement of the new monthly issue of our 'Proceedings' last year, biographical notices of those who had distinguished themselves during their lives as explorers and travellers, or by their works in various departments of geography, have been published at once, or as soon as practicable after their decease. Thus, during the past twelve months records have appeared of the careers of Mr. Keith Johnston, Mr. R. B. Shaw, Major Herbert Wood, Dr. Mullens, General W. C. Macleod, Professor Ansted, Mr. George Long, Mr. W. Hepworth Dixon, Dr. Arthur Leared, Captain David Hopkins, and Mr. Clement Williams. But besides these, our death-roll includes the names of many who, although not geographers, had distinguished themselves in other walks of life, and who cannot be passed over without especial mention, failing a detailed biography, which does not come within our province; a brief reference is therefore made to the achievements or public services of these eminent men in the following summary:—

Excluding, then, those mentioned above, whose notices have already appeared in the 'Proceedings,' the list of our deceased members, in alphabetical order, stands as follows:—Mr. J. P. Allen; Mr. W. Burgess; Mr. Thomas Black, Superintendent of the Peninsular and Oriental Steam Navigation Company's Dockyard, who died on the 12th of July last; Mr. Edward Blore, D.C.L., F.R.I., F.S.A., the eminent architect and antiquarian, who died in September, within a few days of having attained his ninetieth year; Rev. W. T. Bullock, Prebendary of St. Paul's, Chaplain to Her Majesty at Kensington Palace, and Honorary Secretary to the Colonial Bishoprics Fund; Mr. Thomas Brooks; Sir W. Bagge, Bart., M.P. for West Norfolk; Mr. Julius Beer; Mr. W. A. Morgan Browne; Mr. S. Booker; General R. Stuart Baynes; Mr. J. Booth; Mr. R. Clutterbuck; Mr. Capel Cure; Mr. E. W. Cooke, R.A., F.R.S., F.L.S., &c., the well-known landscape painter, who died on the 4th of January; Mr. A. A. Hay Currie, C.E.; Lieut.-General Rodolph de Salis, C.B., who had served with distinction as a cavalry officer throughout the Crimean War, and in India during the Mutiny, and who died on the 13th of March last; Colonel W. Elsey; Mr. Edward Enfield; Dr. J. Murray Foster; Captain C. J. F. Smith Forbes, Deputy-Commissioner of Tharawadi in British Burmah, who died on the 28th of November last; he was the author of the work 'British Burmah and its People,' and of two important philological papers published in the 'Journal of the Royal Asiatic Society' for April 1878, on "Thibeto-Burman Languages," and on "The Connection of the Mons of Pegu with the Kols of Central India," which displayed his great abilities as a linguist and ethnologist; Mr. W. E. Frere; Mr. C. Lewis Grüneisen; Mr. C. W. Gray; Mr. W. Harrison, F.S.A., F.G.S.; Mr. Kirkman D. Hodgson, M.P.; Mr. Alfred Head; Mr. J. L. Haddan, M.I.C.E., who had occupied himself much with the study of mechanical contrivances for facilitating transport in thinly-peopled countries, and read a paper before our Society on the 25th of March, 1878, on the subject, entitled "On Overcoming Geographical Obstacles to African Trade by economical Animal and Mechanical Expedients"; The Right Hon. Lord Hampton, G.C.B., F.R.S., a statesman of distinction, who died on the 9th of April, in the eighty-first year of his age; he had been a Fellow of our Society since 1853; Mr. Henry Alexander Kettle, a nephew of the eminent geographer, Mr. A. G. Findlay, and grandson of Mr. Alexander Findlay, one of the original members of the Society. He had been specially trained by his uncle to continue his hydrographical work, and had shown considerable ability in this eminentlypractical branch of geography. He died in October last at the early age of twenty-seven. Lieut.-Colonel E. R. King; Colonel W. K. Lloyd; Mr. Joseph Wilson Lowry, one of the oldest members of our Society, his name appearing in the original list of members in 1830, who died on the 15th of June last at the age of seventy-six. He was well known as an engraver of scientific subjects, for which his early training and his mathematical knowledge and artistic tastes qualified him in a very high degree. Amongst his principal works are the plates of fossils and sections illustrating the Reports of the Geological Survey of the United Kingdom, nearly all of which were executed by him. Major-General the Right Hon. Sir Thomas Aiskew Larcom, R.E., K.C.B., F.R.S., who was Director of the Ordnance Survey in Dublin from 1828 to 1846, and afterwards Commissioner of the Board of Parks and Public Works in Ireland. During his service in Ireland he was employed on various Government commissions, including that of the Census, and organised a system of agricultural statistics. He died on the 15th of June last, at the age of seventy-eight. Lord Lawrence, G.C.B., late Viceroy and Governor-General of India, whose splendid public services in the Punjab, and during the critical period of the Indian Mutiny, will for ever give him a prominent place in British annals, died on the 27th of June last, in the sixty-ninth year of his age. During the years of his residence in London, after his retirement in 1869, he was a frequent visitor at our evening meetings, and spoke at various times with effect on geographical subjects connected with our Indian Empire. Sir J. G.

Shaw Lefevre, m.a., d.c.l., f.r.s., who was highly and justly esteemed during his long career for his ability, zeal, and industry in urging forward and rendering practicable many measures for the public weal. He died on the 20th of August, at the age of eighty-three; he was one of the oldest members of our Society, having joined in 1833. Mr. Thomas Longman, head of the well-known firm of Longman and Co., died in September last at the age of seventy-five; Mr. A. U. MacKinlay; Mr. J. Remington Mills, late m.p. for Wycombe; Mr. F. Manning; Mr. A. MacEachen; Mr. H. C. Mercer; Captain J. A. MacVicar; Mr. Wm. Nicol, formerly m.p. for Dover; Mr. C. C. Pitcairn; Rev. Dr. A. Raleigh, the eminent Nonconformist minister and chairman of the Congregational Union for 1868, who died on the 19th of April; Mr. M. H. Stanton; Sir George Stephen; Mr. Andrew Swanzy, the enterprising West African merchant, who equipped many scientific expeditions, generally with natural history objects, to explore the interior in the neighbourhood of his factories on the Gold Coast; the chief of these undertakings was that under the command of Mr. Winwood Reade up the Assinie River, an exploration which immediately led to the journey of the same traveller to the sources of the Niger, in which he w[illegible] assisted partly by Mr. Swanzy and partly by the Legislative Council of Sier[illegible] Leone; Mr. J. Todd; Sir R. R. Vyvyan, Bart., f.r.s.; Mr. E. B. Webb, c.e.; Mr. J. Whishaw, f.s.a.; Mr. L. N. Walford; Dr. W. G. Wotton, m.d.; Rev. J. E. White.

ADMIRALTY SURVEYS FOR THE YEAR.

By the Hydrographer, Captain F. J. O. Evans, r.n., c.b., f.r.s.

Following a long-established custom, the Hydrographer of the Admiralty presents to the Society the following condensed statement of the work performed, under the direction of the Lords Commissioners, during the year 1879, in the examination and charting of the seaboard in various parts of the globe:—

The surveying parties engaged on the coasts of the United Kingdom in H.M.S. *Porcupine* and the hired steam vessel *Knight Errant*, under Staff-Captain Parsons and Staff-Commander George Stanley, have been actively employed; the former re-surveying the Solent Channel, the shoals off Saint Helen's in the Isle of Wight, as also the bar of Portsmouth Harbour, and that of Salcombe River on the Devonshire coast. Plans of the anchorages at Lynmouth, Minehead, Watchet, Porlock, Morte Bay, and at Lundy Island, all in the Bristol Channel, were executed by Staff-Commander Stanley. Both vessels, in the finer part of the somewhat exceptionally stormy summer season of 1879, ran several sectional lines of soundings across the English Channel, as also at the entrance of the Bristol Channel, in order to verify and amend the soundings of existing charts; many of these recorded depths being not only of an early, but of an uncertain date. This service is being continued, with special attention to accuracy of detail, not only in the interests of modern navigation but as reliable data for future reference.

On Foreign Surveys, the disposal of H.M. ships has been as follows:—*Fawn*, employed in the Sea of Marmara; *Magpie*, on the coasts of China; *Sylvia*, on the coasts of Japan; *Alert*, in the inner navigable channels between Magellan Strait and the Gulf of Peñas; *Sparrowhawk* (schooner), at Jamaica; *Alacrity* (schooner), Fiji group.

Surveying parties, in hired vessels, have been employed on the coasts of Newfoundland and Labrador, as also in Queensland, South Australia, and Western Australia.

In the Sea of Marmara, Captain Wharton and his assistants in the *Fawn* have made considerable progress. From Erekli on the north, eastward to the Gulf of

Ismid, and thence westward to Mudania Bay and Papa Island, the shores with their adjacent soundings have been admirably charted, on scales varying from one to six inches to the sea mile, and a comprehensive triangulation thrown over the whole sea. The completion of this work may be expected in the autumn of the present year.

On the seaboard of China, Captain Napier and his staff in the *Magpie*, visiting the Gulf of Tong King and Hainan Island, have surveyed the Treaty-ports of Pak-hoi and Hoi-how; determined the position of Guie Chau Island and Cape Cami, including a partial examination of the shoal ground off this headland. Proceeding northward, an extended search for the Actæon shoal was instituted: this reported danger in the neighbourhood of the Shantung promontory, and lying in the highway of navigation for ships proceeding to the Gulf of Pechili, having long perplexed seamen: the search, however, was not successful. A comprehensive survey of the entrance of the Yang-tsze-kiang, extending from Shaweishan Island and the Tungsha banks as a seaward boundary, upwards to Bush Island above the Wusung River, including enlarged plans of the outer and inner bars of this river, is also nearly completed.

In Japan, Commander Aldrich and staff in the *Sylvia* have completed the Goto Islands; also the west coast of Kiusiu from Da Sima to Odimari Bay, including the Kosiki group and the off-lying islands from the western part of Van Diemen Strait. A preparatory triangulation of the coast from Odimari Bay to Cape Cochrane on the east coast of Kiusiu has also been made. The charts of the seaward approaches to Western Japan from the ports of China are thus approaching a satisfactory completion.

After six years' service on the coasts of Japan, the *Sylvia* will return to England in the autumn of this year. H.M.S. *Flying Fish*, an armed sloop, of modern type, will take her place, under the command of Lieutenant R. F. Hoskyn, this officer having taken an active part in the surveying duties on which the *Sylvia* was engaged during the whole of her foreign service.

On the western coast of South America, H.M.S. *Alert*, with an efficient staff of surveyors—in the early part of the year under Sir George Nares, and subsequently under Captain Maclear—has been employed on arduous service, chiefly in a critical examination of the ship channels adjacent to the 50th parallel of latitude. Trinidad Channel—directly opening into the Pacific Ocean—with Concepcion Channel leading from the inner waters north of Magellan Strait into Trinidad Channel, have all been surveyed, together with their numerous ports and temporary anchorages likely to be useful to passing shipping. Innocentes Channel, leading to Concepcion Channel from the now well-known Guia narrows, has also been examined and charted.

Trinidad Channel opens out a clear passage *to* the Pacific Ocean 160 miles to the north of Magellan Strait; and although not so secure of approach *from* the Pacific as the well-known entrance into that strait by Cape Pillar and the Evangelists, it will be found a valuable addition to our knowledge of these waters, as enabling ships passing into the Pacific to avoid the heavy sea frequently experienced in the higher south latitude. Similar in feature to Magellan Strait, the ocean entrance of Trinidad Channel is shoal, having only 40 fathoms water in the deepest part, the depths gradually increasing to 300 fathoms in the inner channels. The southern shores are bounded by bold, rugged mountains, rising abruptly from the sea; whilst on the northern side a low wooded country lies between the sea and the rugged spurs of distant snow-clad mountains: both shores are cut up into numerous bays and inlets. In the later months of the year very few natives were seen; it is understood that at this season the Fuegians leave the inner waters for the outer seaboard, in pursuit of seals.

During the winter months, the *Alert*, having refitted at Coquimbo, then visited St. Felix and St. Ambrose islands, and obtained a series of ocean soundings in an area unexplored by the *Challenger* in 1875. These islands appear to be unconnected with the South American continent, for soundings obtained midway gave a depth of 2250 fathoms (rad. ooze), with a bottom temperature of 33°·5 F., both depth and temperature thus corresponding to the general bed of the South Pacific Ocean. Neither do they join the Juan Fernandez group, for the depths between reached 2000 fathoms. These several scattered islands thus appear to rise from a submarine plateau as isolated mountains. Captain Maclear describes St. Ambrose Island as volcanic, composed entirely of lava arranged in horizontal strata very marked, intersected vertically by dykes of basalt: vegetation is scant, and the island is without water: though frequented by sea birds, the sides are too steep and rugged for guano to collect.

Jamaica.—The survey of the northern shores from Falmouth Harbour to Morant Point has been completed during the past year in the *Sparrowhawk* by Lieutenant Pullen and his assistants, together with well-sounded plans of the several intermediate ports; these will doubtless prove of value to steam shipping engaged in local traffic. The seaboard of Jamaica, with an examination of the adjacent bank of soundings extending to 100 fathoms, is now completed, and the part recently surveyed preparing for the engraver.

Newfoundland and Labrador.—Staff-Commander Maxwell, with his two assistants in the hired steam vessel *Gulnare*, has made good progress in the survey of the shores of Notre Dame Bay. In addition, several sectional lines of soundings have been run between the north-western shores of Newfoundland and the opposite Labrador coast, in aid of navigation in the thick and foggy weather prevalent in this region. Advantage was taken of a brief period of fine weather in the summer months for a close examination of that part of the Great Newfoundland Bank, on which the Virgin Rocks and what is known as their eastern shoals crop up (from moderate depths of 30 to 35 fathoms) into knolls carrying in places as little as 3½ to 5 fathoms. The depths of even 9 fathoms on the eastern shoals are dangerous at times to shipping, from the turbulent sea produced in their neighbourhood in bad weather.

Both the absolute position and the configuration of these dangerous spots may now be relied on. Staff-Commander Maxwell in this examination cleared away many doubtful shoal soundings which had found place on the charts.

Australia.—In Western Australia, Staff-Commander Archdeacon and Navigating Lieutenant Tooker have completed the coast-line eastward of King George Sound to the meridian of 120° east longitude; this includes the Mary Ann River near the east Mount Barren of Flinders. This active party will now be aided by a schooner (*Meda*), specially built and equipped in England for surveying service on the more remote parts of the extensive seaboard of this colony.

In South Australia, the survey of its shores has nearly approached completion, Staff-Commander Howard and staff in the schooner *Beatrice* having reached the province boundary at the head of the Great Australian Bight. Much local work has also been done at the Lower Murray River.

In Queensland, Staff-Commander Bedwell and staff in a hired steam vessel has made considerable progress to the north of his former year's work. The survey of 1879 includes the area between the mainland stretching from Slade Point in 21° 10′ S., to Whitsunday Island in 20° 15′ S., and thence to the Barrier Reefs abreast. This large space, including the Cumberland Islands and their numerous off-lying rocks and sand-banks, has been sounded over, many assumed dangers removed, and correct positions assigned to others.

It is to be regretted that this survey was suddenly and unexpectedly brought to a close on the part of the Government of Queensland, on the last day of 1879, financial reasons being assigned as the cause.

Western Pacific Ocean.—The schooner *Alacrity*, under Lieutenant Moore, has been actively at work among the eastern islands and reefs of the Fiji group. Those between Lakemba and Ongea have been charted in detail; the year's survey further extending to those forming the boundary of the important Nanuka passage. A triangulation has also been effected of a large area in the north-east portion of the group generally.

In this region, Lieutenant G. E. Richards in H.M. schooner *Renard* has done work among the Duke of York Islands, a prominent group in the channel between New Britain and New Ireland; as also in Blanche Bay, on the former of these islands.

Lieutenant Houghton in H.M.S. *Beagle* has also added to our knowledge of the southern shores of New Guinea between the meridians of 148½° and 150½° east. Additions to the topography of the coasts of this region are from time to time received from the London Missionary Society for our charts. The zealous co-operation of the agents of this Society deserves special mention.

Especial thanks are due to Lieutenant Bower, of H.M.S. *Danae*, for additions to the hydrography of the several islands visited by that ship, notably at the Solomon and Admiralty groups.

Among the useful additions to hydrography made by the officers of the Royal Navy in 1879 is a sketch survey of that part of the west coast of South Africa lying between False Cape Frio in 18° 27′ S., and Walfisch Bay in 22° 50′ S.

This examination, made in H.M.S. *Swallow* by Commander Warren and Navigating Lieutenant Baynham, resulted from an expedition which had been organised by the Colonial authorities at the Cape of Good Hope for the relief of a party of destitute Trek Boers, but which failed owing to the impossibility of landing the horses and stores provided, on any part of the coast northward of Walfisch Bay, although, from report, at least one place of shelter as far north as latitude 19° was believed to exist.

The general results of the *Swallow's* examination show that the coast is apparently free from danger, except in lat. 20° 5′ S. and 21° 10′ S., where breakers extend one to two miles from the shore: there are no harbours, no places at which landing may be effected in ordinary weather, and no anchorages except those of a temporary character.

A running survey of the greater part of this open and sandy desert line of coast was made in 1825, by that accurate observer Captain W. F. W. Owen in H.M.S. *Leven*. This survey has been compared with that made in the *Swallow*; the agreement is very satisfactory, and the incorporated work on a suitable scale for the seaman is on the eve of publication.

As advancing our knowledge of the configuration of the beds of several seas and oceans, hydrography is much indebted to commercial firms engaged in laying submarine telegraph cables. Conspicuous in these enterprises is the Telegraph Construction and Maintenance Company. That accomplished geographer Vice-Admiral Sir George Richards, the able managing director of this Company, has placed at the disposal of the Admiralty, for incorporation on their charts, more than 550 deep-sea soundings obtained by the experienced captains of their small steam fleet.

The extent of the operations may be judged when the record gives depths varying from 1000 to 2200 fathoms between Ireland and Newfoundland; in the Red Sea, from 300 to 1200 fathoms; and from 300 to 2100 between Aden and Bombay. Along the entire length of the east coast of Africa, from Natal to Aden, in depths varying from 200 to 1400 fathoms; between Java and Port Darwin, in North-West Australia, from 500 to 1630; and between Hongkong and Manilla, depths reaching to 2350 fathoms.

The Indiarubber, Gutta-percha, and Telegraph Works Company, through their engineer, Mr. R. K. Gray, has also contributed a valuable series of deep-sea soundings in the Bay of Biscay. The painstaking accuracy bestowed on this series has added to the delineation of the 100-fathoms edge of the bank of soundings extending from the French shores on the 46th parallel of latitude.

Acknowledgments are also due to Sir James Anderson, the managing director of the Eastern Telegraph Company, for contributions in the same field.

The Hydrographic Department during the past year has issued 205 Notices to Mariners; an increase, indicative of much activity in the interests of commerce over the globe. Thirty-two Hydrographic Notices have also been published, in 323 octavo pages.

In addition to the usual Tide Tables and Light Lists—gradually expanding from the activity just referred to—the following revised editions of Sailing Directions have been published:—

Bristol Channel.

China Sea Directory, vol. ii.—This embraces the navigation of the China Sea between Singapore and Hongkong.

Africa Pilot, Part I.—This volume includes the West Coast of Africa to the River Cameroons; with the Azores, Madeira, Canary, and Cape Verde Islands.

Africa Pilot, Part III.—This volume includes the South and East coasts of Africa from the Cape of Good Hope to Cape Guardafui, together with the islands in the Mozambique Channel.

Australia Directory, vol. ii.—Comprises the East Coast, Coral Sea and Torres Strait, South-Eastern Coasts of New Guinea, and Louisiade Archipelago.

There are also preparing for early publication; 'Mediterranean Pilot,' vol. iii.; 'The West Coast of Hindostan Pilot'; and 'The Norway Pilot,' Part II.

Since the statement of last year, sixty-two new plates of charts and plans have been published; many of these represent original work, and all may be considered of immediate interest to seamen. 2040 chart plates have received corrections and additions, some of these in extended and important details; notices of these latter are now advertised as in the case of newly published charts. 192,060 charts have been printed, during the financial year, for Her Majesty's Service and for the use of the general public.

Indian Surveys for the year 1878–1879.

THE principal triangulation of all India has now so nearly approached completion —on the lines originally laid out by Colonel Everest,—that only one party was employed on it during the official year 1878–79. This party, under Lieut.-Colonel Branfill, was engaged in completing the Madras Coast Series, a chain of triangles running from Madras to Cape Comorin, and designed to supplement the somewhat restricted and insufficient operations of Colonel Lambton in the early part of the century, and to supply a means of connection between the Surveys of India and Ceylon. Of secondary triangulation some important pieces of work were carried out during the year under review. The Eastern Frontier Series, having been carried along the Tenasserim portion of the peninsula, had arrived at a point not much more than 130 miles distant in a direct line from Bangkok, the capital of Siam. On the other hand, owing to the extraordinary length of the Malay Peninsula, the distance by sea between the two points is fully 2000 miles. It was thus considered desirable in the interests of exact geography that the two localities should be directly connected and a check supplied on the maritime surveys executed along the coasts. With the co-operation of the Siam Government the line of triangles was successfully laid by Captain Hill up to within 25 miles of Bangkok, though the intricate and unfavourable conformation of the ground in the narrow tract on the British side of the frontier line, coupled with exceptionally heavy rains, occasioned unusual difficulties to the surveyors. During the current season (1879–80), the operations were to consist of the completion of the branch series to Bangkok, and the extension of the principal series to the southernmost point of Tenasserim. Here the Indian triangulation will be brought to an appropriate termination, and a base of verification measured with the Colby apparatus of compensation bars and microscopes. A branch series of secondary triangulation, extended from a side of the Great Indus Series and commenced in the previous season, was continued by Mr. Price across the flat woodless waste of desert between Jacobabad and the Bolan Pass, and thence up through Quetta to the boundary of Pishin in Southern Afghanistan. In the southern part of British Burma the triangulation was carried down to Cape Negrais, its southern extremity, whence the position of the Alguada Lighthouse was determined, and for a short distance along the coast in the Rangoon District. The beacons to be erected on the site of the Krishna Lighthouse (which so mysteriously disappeared in 1878) will be determined by a traverse survey.

Turning to the topographical operations carried on in British territory, we observe that the Gwalior and Central India Survey party, under Captain Strahan, were chiefly engaged on surveys of the Luni River, which discharges into the Runn of Cutch, and of the city of Oodepur. Another party operated in various tracts in the Khandesh districts, and some of the native states in the vicinity of the Tapti, while to the north a party under Major Wilmer completed a good out-turn of work in Gwalior, Indore, and other adjacent independent native states.

In the east of India, the party engaged hitherto on the survey of the Khasia and Garo Hills, south of the Brahmaputra River, was transferred to the southern portions of Cachar and Sylhet, where Major Badgley conducted a survey, partly revenue and partly topographical, of tracts which included various tea grants and estates. Of these no proper survey had previously existed, and the want thereof was supposed to be costing Government heavily in fraudulent zemindari claims. Of the various tribes encountered in the course of his operations, Major Badgley reports that both the Tipperahs and Manipuris are pleasant people; the former being excellent hands at jungle-cutting (an important qualification from a surveyor's point of view) and bringing down a hill-side of bamboo like corn before a reaper. The Sylhettias, on the other hand, are strong, cowardly, and morose, and quite uncompromising in their hatred of Europeans, whom they molest in every possible way.

In Rajputana a very large expanse of country still awaits survey, though this is being gradually diminished by the considerable areas mapped year after year. The year under review formed no exception to this rule, and under Lieut.-Colonel Depree a large out-turn of triangulation and detail survey was completed in Bikanir, Jodhpur, and Shaikhawati. The cessation of famine works in Mysore operated beneficially on the topographical survey of that province, in enabling surveyors who had been temporarily detached for famine duties to be retransferred to their legitimate work. Triangulation was carried on along the boundary between Mysore and South Canara, and the detail survey of this long debated frontier line will be continued till finished. In Guzerat the survey operations are of threefold nature, viz. a topographical survey, the same with certain additions required for revenue purposes, and a special forest survey on a larger scale (4 inches to the mile) of the Dangs. This latter tract so far as surveyed consists of one mass of hills of bold and complicated features and wild aspect, densely covered with forest trees which make the progress of the survey very tedious. The forests also lie in a notoriously unhealthy tract of country which it is not safe to enter till March, when three-fourths of the season is over. It will be readily understood therefore that this survey is one of unavoidably slow progression.

Revenue surveys on the two-inch scale have been conducted in the Saharanpur and Muzaffarnagar districts of the North-West Provinces, together with larger scale surveys of some of the riparian villages in the Umballa district, for the purpose of determining alluvial and diluvial disputes. The topographical operations in the Peninsula of Kattywar lay chiefly in the Hallar and South Prants of the province and embraced part of the inhospitable and difficult tract called the Gir, a well-known refuge for outlaws and marauders. This survey had not been conducted the previous season, owing to the scarcity of water in that locality; the next year (1878–9) the rainfall was ample, but was succeeded by so unhealthy a season that the people of the surrounding districts died in thousands. Notwithstanding this serious drawback the survey was successfully completed in about six weeks, and preparations made for the extension of the work into Cutch during 1879–80. A revenue party was employed in continuation of previous seasons in the Ahmadabad and Puná Collectorates of the Bombay Presidency, where the work is now fast approaching completion. Arrangements have therefore been made for the transfer of this party to the Konkans, where there is enough to occupy the two so-called "Deccan" parties fo four or five years to come. Up till the 11th of September, 1878, the party was under the charge of Captain E. W. Samuells, but on the outbreak of the Afghan war this officer was ordered to accompany the Khaibar column. After narrowly escaping from the enemy's artillery fire while surveying at the battle of Ali Musjid, this brave and zealous surveyor unfortunately fell a victim to fever, on the 21st December. The other Deccan party was under the charge of Major Hutchinson, its regular chief, Major H. C. B. Tanner, having been also called to the seat of war in Northern Afghanistan. The operations were chiefly confined to the Sholapur district. *Muzawar*, or village surveys, on the four-inch scale, progressed in the Dera Ismail Khan, Bannu, Rawalpindi, Sirsa, and Jhelum districts of the Punjab, and cadastral surveys in the Banda, Mirzapur, Jaunpur, Budaun, and Ghazipur districts of the North-West Provinces. Besides these, cadastral surveys of the Khorda Government estate (Purí district) and of certain irrigated tracts in the Cuttack district were conducted, as well as in Cachar, where a resettlement of the district is pending, in certain estates of the Lohardugga district and in the Hanthawaddy (late Rangoon) district of British Burma. For this last survey Burmans were employed as field-surveyors instead of Hindustanis, and this measure has been found both politic and economical, though the Burmese are said to be difficult to keep at work and to be adepts at "fudging." Finally, revenue surveys of certain estates in the Kamrup district of Assam, and of various tracts around Darjiling, including one of the town itself, were in progress. Lieutenant Harman, R.E., under whose charge the last-named survey was placed, is now carrying on a topographical survey of Native Sikkim, of which our knowledge has hitherto been derived from Dr. Hooker's survey, and of which a better acquaintance was very desirable. He anticipates acquiring in the course of his operations much geographical information respecting the adjacent trans-frontier districts, without being compelled to cross the British frontier.

Geographical Operations in Afghanistan.—Geographical science has benefited greatly from the very complete arrangements for surveying which have been made in connection with and consequent on the military campaign in Afghanistan. On the outbreak of the war experienced surveyors were attached by the Surveyor-General of India to each of the four columns formed, and the results have been to enlarge most considerably our knowledge of a country respecting which we had been compelled to remain in comparative ignorance for many years.

Captain Beavan carried a route survey from near Kusmore along the Dera Bugti road as far as Lehri, from the foot of the Bolan Pass to within a short distance of Quetta, and from Quetta to Candahar. He then accompanied General Biddulph's force to Girishk, the well-known fort which commands the passage of the Helmund on the road to Herat, surveying the line of road and also as much of the country round Girishk as opportunity afforded. On returning to Candahar he was employed with other officers in making a survey of the country round Candahar within a radius of 12 miles. Captain M. W. Rogers carried a route survey from Quetta to Candahar, and also accompanied General Hughes' force on its march from Candahar to Kelat-i-Ghilzai by the direct route up the Tarnak, returning by the Argand-ab River. Captain W. J. Heaviside carried a route survey from Quetta to Candahar, checked by occasional latitude observations, besides surveying the Kadanai Valley, lying north-east of the Kwaja Amran range, with the aid of Captain T. Holdich (who has since been deputed to Kabul) and subsequently, still in company with the last-named officer, carrying a rapid but most valuable survey of the new Tal-Chotiali route from Balozai in the Pishin Valley to Fort Munro on our frontier. The rapidity with which this important survey was made, the march being executed at the average rate of 12 miles a day, made it impossible to carry a continuous triangulation across the entire breadth of country; thus after a time Captain Holdich had to depend on his plane-tabling alone without any extraneous check, but its eventual connection with the trigonometrically fixed point of the Sulimanis shows that the work was fairly accurate. From first to last it embraced an area of about 5000 square miles. Lieutenant Gore had been specially deputed to Quetta in order to make a survey of the Pishin Valley, which he accomplished on the half-inch scale. He also accompanied an exploring party under Captain Wylie over the Toba Plateau, and another under Captain Showers (since unhappily slain by Kakars) round the east and north boundaries of Pishin, and across a new tract of country stretching from Quetta into the Kadanai Plains. Lieutenant Hobday was also usefully employed in carrying a route survey from Chaman to Candahar, and in the operations round the last-named city. The general control of the survey operations in Southern Afghanistan rested with Lieut.-Colonel W. Maxwell Campbell, who took advantage of a visit to Shorawak to make a route survey of about 150 miles, closing on Quetta, through new country between Pishin and the great southern desert of Afghanistan. He then took observations at Quetta for determining the difference of longitude between that place and Candahar by means of the newly-established telegraph line, and subsequently accompanied Captain Wylie and Lieutenant Gore on their trip to the Toba plateau. Colonel Campbell also visited Kalat-i-Ghilzai in company with General Hughes' force in October last, after which he returned to India.

To the Kurram Valley column, under General (now Sir F.) Roberts, Captain (now Brevet-Major) Woodthorpe was attached as surveyor, he being subsequently joined by Captain Gerald Martin and Lieutenant Manners Smith. Captain Woodthorpe accompanied the first advance of the force up to the Paiwar Pass, and plane-tabled the country *en route*. He was present at, and took part in, the military operations of the 28th November, and 2nd and 3rd December, 1878. In the second of these actions, he had a marvellously narrow escape, as in the dusk of the morning he went up by mistake to a breastwork occupied by the enemy, who did not discover his presence till he was within six yards, when they fired a volley at him. The stock of his pistol was smashed by a bullet which grazed his side and drove a piece of his clothes into his sketch-book, which was considerably damaged, but he himself happily escaped uninjured. On the advance of the force he continued his plane-tabling up to the Shutar-gardan Pass, the position of which was found to be very erroneous on the old maps. Captain Woodthorpe also accompanied the expedition to Khost, nearly the whole of which was mapped, and made a variety of reconnaissances in different directions, in the course of which many of the adjacent valleys and much of the southern watershed of the Safid Koh was mapped. He also ascended the lofty peak of Sikaram subsequently to Mr. Scott's visit thither, but was unable to do much from that point, owing to the unfavourable condition of the atmosphere. The total area amounted to about 3000 square miles, the scales of survey being one inch for routes and one-quarter inch for the geographical work.

On the formation of the Peshawur Column under General (now Sir Samuel) Browne, Major Tanner, Captain Samuells, and Mr. Scott were attached thereto for surveying purposes. Subsequently Captains Leach and Strahan joined the party. Major Tanner carried a continuous route survey from Ali Musjid to Jalalabad, reconnoitring the ground on each side as far as was practicable; and though it was not found possible to extend a triangulation from the British frontier, the work was nevertheless successfully connected with points fixed several years previously by Captain Carter and other officers. Jalalabad was thus found to be about five miles nearer to Peshawur than previously imagined.

In May, Major Tanner undertook an exploration into Kafiristan through the Kunar Valley and Chuganistan, and after several perilous adventures reached Arat; but there, owing to the hardships and exposures incident to the undertaking, he was attacked by fever, and compelled to abandon his design and return to Jalalabad. Captain Leach joined the force in January, and surveyed a good portion of the Bazar Valley and the country round Jalalabad, chiefly in the Shinwari country and on the northern slopes of the Safid Koh range. His work was cut short by a severe wound received in action with the Shinwaris, in which, however, his gallantry won him the Victoria Cross. His place was supplied by Captain Charles Strahan, who executed a survey of the country between Safid Sang and Surkpul, and also fixed several peaks on the Hindu Kush and in Kafiristan, besides others in the Safid Koh, Siah Koh, and Karkatcha ranges. In traversing the Hisarak district Major Stewart and Captain Strahan were for some time in a position of considerable peril owing to the threatening conduct of the natives, who were within an ace of falling upon the party, but were eventually prevailed upon to desist. Mr. G. B. Scott made a variety of sketches in the country south of the Kabul River, and between Jamrud and Dakka in the Bazar Valley and the Shinwari country. In surveying on the north bank of the Kabul River, Mr. Scott and his small escort were attacked by a strong party of Mohmands, and a hand-to-hand fight ensued, in which he displayed great gallantry and good judgment, thereby probably saving his whole party from destruction. Later on Mr. Scott successfully ascended to the summit of the Sikaram peak of the Safid Koh (15,620 feet high), whence he determined the position of several distant peaks, including a very prominent peak to the north, which he describes as "a pyramid standing far above the heads of all the surrounding peaks of the Hindu Kush." A considerable amount of geographical information was also obtained to the north of Jalalabad in the Dasht-i-Gumberi Plain and Lughman Valley, from the Daronta Pass to the junction of the Alishang and Alingar rivers, and of the adjacent hills and river valleys.

The Surveyor-General of India has recorded in his Annual Report some very important remarks regarding the experience gained during the survey operations in Afghanistan. The result is to show the indisputable superiority of the plane-table for rapid, trustworthy sketching purposes, where this operation starts from a base, the length and azimuth of which are known, and is supplemented by a fair proportion of commanding positions and hill peaks which are susceptible of identification, and which thus supply a check upon the plane-tabling or theodolite surveys. As a further check on the accuracy of the work, several of the survey officers in Afghanistan were supplied with a 6-inch transit theodolite—an instrument which has a complete vertical circle, and an eye-piece fitted with a pair of "subtense micrometers," intended to measure small angles subtended by distant objects in the field of the telescope. By means of this "universal" instrument astronomical observations and the ordinary measurement of horizontal angles can be readily determined, as well as the distances of objects of known length; and though the instrument requires delicate manipulation, in skilful hands it is capable of yielding admirable results.

Trans-Himalayan Explorations.—The last Indian Survey Report contains accounts of these explorations beyond the British frontier, conducted by trained native surveyors. The first of these was a journey along the lower valley of the Sanpo for some distance beyond the easternmost point to which the Tibetan portion of this great river had been traced. By this means the survey of this river, the identification of which with the Indian Brahmaputra has been so long a matter of dispute, has been carried to Gyala Sindong, a fort situated within 100 miles of the highest point to which the Dihong has as yet been ascended. In order to place the identification of the two rivers beyond possibility of a doubt, Lieutenant Harman is arranging for a number of logs of timber to be specially marked and floated down from Gyala Sindong into the Assam Valley. As the intervening belt of country is peopled by wild tribes called Abors, who have always offered a determined opposition to any attempt to pass through their country, this plan is probably the most feasible method of solving the problem.

Another exploration, also in south-eastern Tibet, was made in 1875-6, by a native called L——, who crossed the line of the Great Himalayas by the direct route, between Sikkim and Shigatze, a line over the Kangra lama La pass, which, though it offers but few difficulties, is jealously guarded by the Tibetans, who maintain a fort at Ganpa Jong, just beyond the frontier. From Shigatze the explorer proceeded down the valley of the Sanpo, surveying as he went a previously unknown section of the course of that river as far as the town of Chetang. Eastward of that point he was told it would be impossible to proceed without an escort, so he turned southwards, and with a slight deviation followed the route traversed by the Pundit Nain Singh, as far as Towang. But at this town he was seized and detained, and eventually sent back to Shigatze, from whence he made his way to Darjiling by the way followed by Captain Turner in 1783.

The last piece of geographical exploration on the part of a native deserving mention is an adventurous journey performed by "the Mullah," an intelligent Mahomedan, whose previous travels had revealed to us a considerable part of the geography of the Kunar and Indus Valley, and of the country about Yassin, all lying in the independent region between Afghanistan and Kashmir. His more recent investigations were carried on in the Swat Valley, which is now mapped out for us for the first time, as well as the Kandia Valley and the north-western part of the Indus Valley where that great river winds its course through independent ground before rejoining the British frontier near Amb. This region is one characterised by considerable wealth of timber, a peculiarity apparently due to the copiousness of the rainfall which is deposited in great quantities south of the great range running south of Mastuj and Yassin, but very sparsely beyond it. In the districts to the north of that chain, Major Tanner successfully carried on a survey embracing an area of about 2000 square miles, about Gilgit and the course of the Hunza River. Hopes are entertained that with the co-operation of our Resident at

Gilgit, Kunjut, Shimshal, and the unknown tracts lying about the western Muztagh may soon be examined by Major Tanner, and that officer may eventually be enabled to enter Kafiristan by way of Gilgit and Chitral, in preference to the more hazardous and difficult way from the Kabul Valley.

This review of the Indian Survey operations may be appropriately closed with a brief reference to the Indian tidal operations which have now been organised on a far more extended scale than previously. Under the superintendence of Captain Baird, tidal instruments were at work during the year 1878–79 at Bombay, Karáchi, Karwar, Madras, Vizagapatam, Paumben, and Beypur, and with the aid of the excellent tide-calculating machine recently constructed for the Secretary of State for India, by Mr. E. Roberts, of the Nautical Almanac Office, tide tables for these ports, computed according to the Harmonic Analysis method, will, as it is anticipated, soon be available for the use of navigators in Indian waters.

Observations on the Western side of Lake Nyassa, and on the country intervening between Nyassa and Tanganyika.

By James Stewart, C.E. (Livingstonia Mission).

(With Maps and Section.)

We have received, through Dr. George Smith, Foreign Secretary to the Free Church Missions, the following letter from Mr. James Stewart, giving a further account* of his recent explorations north-west of Lake Nyassa, and communicating his valuable longitude observations and maps:—

Livingstonia, *February* 18, 1880.

In continuation of my report of December last, I wish now to add a few general remarks, as well as some minor details, which in my hurry I omitted. I have now traversed the whole of the west coast of the lake, and know its character. A concise description of it may be valuable. From the south end of the western bight to Mpemba the coast is fringed by reeds, and swamp extends some distance inland. Landing can be effected at very few points. Between the swamp and the hills (distant from the lake some 10 miles) there is a good deal of very rich and fertile soil. It is inhabited in some places, and in the opinion of the natives, is a most desirable country. For white men, however, I should say the climate would be deadly. It is hot, damp, and close, and for this reason must be rejected as a site for a station. Inland is the Mangone tribe, under Chikuse, with whom we would gladly station a teacher if one were available. Between Mpemba and Kota-kota the country is dry and sterile, and totally uninhabited. At Kota-kota the soil is little if any better. The population is attracted to the place only by the trade, which comes to a focus there, attracted by the safe and spacious harbour. The people draw a miserable subsistence from the soil, cassava being the staple food. Kota-kota is at present the principal approach to the interior. It is in the hands of the Arabs, and is admirably adapted to their trade; it is therefore, as yet, the most important place on the lake. I will show, however, that a rival harbour and route can be opened up, which will suit the purposes of an English company quite as well. Between Kota-kota and Mount Kowirwi the country is poor and valueless, though here and there it is sparsely inhabited. Between Kowirwi and Mankambira's Point a very large population is gathered under many petty chiefs, but all belonging to the same tribe, the Atonga. Situated in the centre of this stretch is Bandawe, where our present sub-station is located. The soil is fair, in short the best on the west coast. We have already had a year's experience of the climate, which, at least, is decidedly better than at Cape Maclear. The district naturally includes the whole of the area between Mount Kowirwi and Mankambira's, taking in the Matete Valley, the whole coast-line, which is studded with villages, and the Limpasa Valley, which is now being repeopled. It is the only populous district on the lake shore. Between Mankambira's Point and Deep Bay there is a rock-bound coast, with one good harbour and one or two inferior ones. A good many small fishing villages lie in the numerous bays, whose inhabitants laboriously cultivate a few patches of cassava on the steep hills. Six miles south of Mount Waller access is had to the Rikuru Valley by a very difficult path. The valley itself is fertile, well watered, and the climate is most likely healthy. The inhabitants would doubtless welcome us, and I trust a station may soon be formed among them. North of Deep Bay the country is very poor, hard clay plains and swamp alternating up to the north end of the lake at the Rombashe River. Even at Karonga's, the only populous part, much of the low ground is under water during the rains, and must be very unhealthy.

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* Vide 'Proceedings' R. G. S., *ante*, p. 247.

From this rapid survey it will be seen that we have choice of only two localities, namely Bandawe and the Rikuru Valley. Eventually both positions ought to be occupied. The question is, which should be first taken in hand. Besides the advantages above mentioned, Bandawe can without any very great expenditure be made into a rival harbour to Kota-kota. A short breakwater is all that is required. If this were done, trade would almost certainly be attracted to the place. It is believed that a trade route already exists between the Rovuma River and Lake Nyassa, at Chitesi, nearly opposite Bandawe. This is a shorter route for traders from Kilwa, and would likely be preferred by them. The civilising influences of commerce would thus be added to the Christianising work of the mission, and a serious blow would thereby be given to the slave trade. From Bandawe ready access is had to the Mangone country, and thence north and west to the country visited by Mr. Moir last July. Mr. Moir already talks of making Bandawe his headquarters on the lake. Against all this, the Rikuru Valley has the advantage of a better climate. I certainly do not underrate this advantage, but as we should have a sub-station and sanitarium at Mombera's within easy reach, the disadvantages of a lake station would be much reduced.

With respect to the country between Lakes Nyassa and Tanganyika, much information may be expected from the report which Mr. Thomson on his return will give to the Royal Geographical Society. It has already been suggested that Merere's village should be chosen as a mission station. But Merere is now living at Marema, perhaps one hundred miles north-west of Lake Nyassa, and therefore, I fear, quite beyond what will be for some years the limits of the Free Church's field of operations. I am more inclined to look forward to having a station at Mambwe. It lies on the route between the two lakes, and already, as I understand, measures have been proposed to construct the road. If this were done there would be nothing to hinder the London Missionary Society, possibly in association with the Livingstonia Central Africa Company, from sending a steamer to Lake Tanganyika by way of the Shiré River and Lake Nyassa. From conversation I had with Mr. Thomson at Pambete, I do not think that the route he followed is at all to be compared for easy travelling with the one I have now sketched out. Indeed, I fully anticipate that the London Missionary Society will ere long obtain all their supplies viâ Lake Nyassa, and possibly through the Livingstonia Central Africa Company. If this be a just anticipation, Mambwe would likely become an important place, and would be a good situation for a mission station. The cost of a road fit for waggons I could not estimate at less than 3000*l.*, or including European supervision, not much less than 4000*l.* I would not recommend that Mambwe be occupied before the mission or the company is prepared to begin this work. The station should be planted as soon as the road is begun; much waste of European labour would thus be prevented.

I do not desire to give too favourable a prospect of trade. Ivory, of course, there is, but not in large quantities. Indiarubber is produced about the shores of Lake Tanganyika, and trade in this article might be extended. Copper also is an article of export. Iron is found in abundance, and it doubtless would be largely used in local barter. Oil would likely not pay for export. It is not, however, to be expected that anything observable in the country in its undeveloped state could yield a paying trade. Until its natural productions are wisely stimulated, there can be no commerce to speak of. The ivory trade is not capable of development, though it may be transferred from the Arabs to English hands. Even though that were done it will never do the country much good, as it diverts the attention of merchants from other articles, the production of which would be more beneficial to the country. It is a saying among the Portuguese that the slave trade and the ivory trade have been the curse of Africa. I fully agree in that opinion.

As I mentioned in my report, I found the distance between the two lakes much greater than I expected. From the first protraction of my survey I made the longitude of Pambete about 31° 20′ E.; but owing to the absence of good landmarks on the Mambwe plateau, I cannot place much reliance on the route-survey. I have, therefore, accepted the results of my best sets of lunar observations as giving an approximately correct longitude, and fixed Pambete, accordingly, at 31° 4′ 30″ east longitude.* On a separate sheet I give details of my observations, in order that Mr. Stevenson or some other member of the Royal Geographical Society may lay them before the Society, that they may be re-calculated and recorded. I also send statement of the barometric readings made at Pambete, on the mercurial barometer supplied by the Royal Geographical Society to Mr. Thomson, along with the corresponding observations made at Livingstonia, and a section of the country between the two lakes. My map, comprising the northern portion of the lake and the route to Lake Tanganyika, is also enclosed, and I request that it may be placed at the disposal of the Royal Geographical Society. If they see fit to publish it, I trust it may be done on the same scale as my survey of 1878, in order that the two maps of Nyassa may be joined and appear as one. I intend to send a tracing of my map direct to Zanzibar to the members of the London Missionary Society party, as it may be very useful to them.

Note on the Lunar Distances, observed by Mr. James Stewart at Pambete, November 9th, 1879.

By Mr. John Coles, Map Department, R.G.S.

I have computed the four sets of lunars sent home by Mr. Stewart by three different methods, viz. Raper's rigorous method, Riddle's variation of Borda's method, and by Chauvenet's special lunar tables, and the mean of results places Pambeto in longitude 31° 21′ 30″ E., which agrees within 1½ miles of its position as fixed by Mr. Stewart from his traverse survey, and is within 5 and 8½ miles respectively of the longitude of the same place as fixed by Mr. Stanley by observation and Mr. Thomson by traverse survey. One of the sets of lunars has been rejected, the observations having been taken at very unequal intervals. It may be interesting to note the various longitudes assigned to Pambete by those travellers who have had the opportunity of fixing its position. They are as follows:—

	°	′	″
Dr. Livingstone	31	40	00 E.
Mr. H. M. Stanley	31	15	25 E.
Mr. J. Thomson	31	30	00 E.
Mean of results of Mr. James Stewart's observation	31	21	30 E.

Thus the mean of Stanley's and Thomson's longitudes is 31° 22′ 42″ E., being within one mile of the mean result of Mr. Stewart's observations, which also agrees within 1½ of the longitude by account of Mr. Stewart himself.

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* This position, however, has been altered, on the reduction of Mr. Stewart's map for the present number of the 'Proceedings,' to 31° 21′ 30″ E. long., in accordance with the re-computation of his observations by Mr. Coles; the consequent diminution of distance has been distributed, in the map, throughout the entire route from Lake Nyassa.—Ed.

GEOGRAPHICAL NOTES.

Further Belgian Expeditions to Central Africa.—A fresh expedi has just left Brussels to join the Belgian officers already establishe Central Africa. The party consists of Captain Ramaeckers, of Engineers, Lieutenant Van Becker, of the Artillery, and M. d Meuse, a photographer; the two first have already visited Africa. T other officers, Major van den Bogarde, of the Engineers, and Lieuten Le Leu, of the Artillery, will also shortly take their departure f Brussels, being charged by the King with a special mission to as tain the possibility of reaching Central Africa from the north by White Nile and its affluents.

Progress of Dr. Lenz in North-Western Africa.—We learn fro despatch, obligingly communicated to us, from the British Minister Tangier to the Foreign Office, that this enterprising traveller has cro the Atlas, and is on his way to Timbuctu, in spite of the refusal of Moorish authorities to sanction his proceeding. It appears that a waiting for some time at the northern foot of the mountains he cro to Terodant. Up to that place he was accompanied by his Moor guard, but the authorities having declined to protect him any furth on the ground that the Sultan has very little power of control over wild Shloh tribes in the southern districts of his empire, he push forward alone towards the Soudan, accompanied by a Moor named H Ali. He is reported to have assumed the garb of a Mahomedan, calli himself a Turkish doctor. Dr. Lenz is well known as a geologist, a it is with a view to geological investigations partly that he has und taken the present journey. He travels on behalf of the German Afric Society.*

Missionary Expedition to the Upper Zambesi Region.—At the end January of last year a party consisting of eleven Jesuit missionari under Père Depelchin, left Southampton for the Cape of Good Hope, wit the object of founding a mission in Central South Africa. On the arrival at Capetown they proceeded to Grahamstown, whence, after con pleting their preparations, they started for the interior on April 16th, wit four waggons and provisions for six months. They reached Kimberle on May 11th, and Shoshong, the capital of the Bamangwato country, o July 24th. Here they desired to found their first station, but the kin refused to allow them to establish themselves in his territory. Continuin their march northwards, the missionaries accordingly directed their step towards the Matabele country, and arrived at Tati on August 17th. Pèr Depelchin then went on to Gubuluwayo with two companions, to obtain Lobengule's permission to found a mission in his kingdom. This was accorded, and the rest of the party was brought up to the capital, where they settled on the plateau near the king's residence. They have also obtained from a Mr. Grant (to whom the king has given a large tract of country) possession of a vallĕy, two miles north of Gubuluwayo, which is said to be well-watered and fertile. The last letters state that a large reinforcement of missionaries left Kimberley on the 19th of last March on their way to the Upper Zambesi and the Marutse-Mabunda country. They expected to reach Tati in the middle of May. About that time another expedition would leave Gubuluwayo, on a visit to King Umzila. The observations for latitude and longitude recorded in the last number of the 'Proceedings,' p. 367, were taken by Père A. H. Law during the northward journey of Père Depelchin's expedition.

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* Vide 'Proceedings' R. G. S., *ante*, p. 196.

The Surveys for the proposed Trans-Sahara Railway. — Colonel Flatters, whose expedition has been previously referred to (pp. 123, 183), left Wargla on March 3rd, and appears to have met with no difficulty in reaching El-Moukhouh (N. lat. 26°), in the Asgāz Tuareg country, some 466 miles south of Wargla, and 155 miles south of Timasanin. Though well received by these Tuaregs, Colonel Flatters was unable to meet with any chief among them of sufficient authority with whom he could enter into negotiations on behalf of the French Government. He found that the real head of these tribes—a very aged man, who is said to be under Turkish influence—lived at Ghat, and he accordingly put himself in communication with him. These negotiations, however, becoming very protracted, without any satisfactory result being attained, and provisions, &c., beginning to run short, Colonel Flatters returned to Algeria in May, and has since arrived in France. It is stated that he will resume his surveys and explorations after the hot season is over, probably during the month of October. More solid results would appear to have been achieved by the expedition under M. Choisy, an engineer of *Ponts et Chaussées*, who returned to Constantine after thoroughly examining the country between Wad Rirh and El Golea; he also made a detailed survey of this region in regard both to its geological formation and to the configuration of the soil. Between Wargla and El Golea the expedition devoted especial attention to determining the elevation of all the affluents of Wady Mia, which they first met with after passing Zaraia. The chief results of M. Choisy's expedition may be considered to be the accurate determination of the lines of depression in this region of the Sahara, and the reconnoitring of the passages across the belt of sandhills which bar the route to In-Salah, in the Tuât oasis. M. Choisy has lately returned to Paris, and has addressed a preliminary report on his labours to the Governor-General of Algeria.

Major Tanner's Surveying Operations in Gilgit. — Major Tanner, with the aid of two practised native surveyors, started from Murree, and arriving at Gilgit on the 30th August last, mapped out some 1800 square miles on the $\frac{1}{4}$-inch scale about the Gilgit River, and up the Hunza River towards Kunjut and Hunza Nagar. Now that Major Biddulph occupies the post of resident at Gilgit, the country is said to have quieted, and the opportunity may possibly occur for Major Tanner to extend his surveys towards Shimshal on the north and Chitral Kafiristan on the west.

The "Mullah" in the Valleys of the Swat and Upper Indus.—The following are details of the exploration of the Swat River by the "Mullah," which have come to hand since the brief mention made in the first volume of the 'Proceedings,' p. 716:—

In order to disarm suspicion, this explorer engaged a trader from Swat to assist him in making arrangements for floating timber from Lamuti, in the valley of the Panjkora which joins the Swat, or else in the Kandia Valley, and so down the Indus. Starting from Abazai, which is situated at the point where the Swat River enters British territory, the "Mullah" attempted to ascend the course of the river, but found this impracticable, owing to the rocky and precipitous nature of the hills on each side. He therefore made a detour northward, viâ Gandere and Kot, over the southern watershed of the river, and reached Issar in the Swat district on June 15th, 1878. Here he was informed of the circumstances of the murder of his brother, who had been treacherously shot there a few years ago, on his first attempt at exploration. From thence the "Mullah" ascended the valley of the Swat River in a north-east direction towards the Kohistan, from which it emerges. As this valley had never been explored previously, the results are of importance. Rice is the staple food of the people, but other kinds of grain are also produced. Sheep, goats, cows, and buffaloes are in great abundance, and the river as well as its tributaries abounds in fish. Different kinds of coin are current in the valley, but the British coin is alone valued at par. There are two large villages, called Thana and Mingraura, which have both good-sized bazaars, containing Hindu *banias*, and other shops, such as bakers, fruiterers, cloth merchants, blacksmiths, &c. Fighting and lawlessness appear tolerably rife however. At Churrai the Swat Valley contracts and ends, the valley beyond being called the Kohistan. The hills on either side are clothed with forests of trees of huge size, which beyond the village of Kalam attain such a magnitude, according to the "Mullah," as to surpass description. The species are the *ranzro* (the royal or black pine), which is very valuable, each tree being worth from 150 to 250 rupees in the Peshawur market, the *ucher* and the *piwich* (a species of deodar). After examining a tributary called the Gabrial River, coming from the west and crossing the water-parting into the basin of the Panjkora, he came to Lamuti, where great scarcity prevailed, and supplies were exceedingly difficult to procure. This is one of the three Kohistans or highlands which lie between Kashkar or Chitral and the Indus. The first of these is the Indus Kohistan, comprising the villages of Kolai Patan, Palas, Jalkot, &c., and containing the largest population of the three. Its inhabitants are well-built and powerful men, of a fair complexion, who dress themselves in coats and trousers somewhat resembling the English fashion; the second Kohistan is that of Swat, which somewhat resembles the first; and the third that of the Panjkora Valley, comprising the villages of Tal, Lamuti, and Patrak, the inhabitants of which are quite different, both in complexion and dress.

Proceeding past Ushu up the valley, which is here subject to frequent disastrous avalanches, the "Mullah" passed two routes which lead across the mountains on the right into the Kandia Valley (Indus basin), and inquired about the passes leading to the left into Kashkar or Chitral; but having learnt that these were still blocked with snow, which had been excessive* that winter, and which they anticipated would probably make the passes altogether impassable that year, he decided to cross into the Kandia Valley by the Palesar Ravine and Pass, where the severity of the cold caused the party great suffering. They were obliged to take off their shoes, and even then the way was so slippery that a foothold had to be dug out at each step. On crossing the water-parting between the Swat and Kandia rivers the whole party had to slide down the face of a steep slope, and thus descended into valleys tenanted by Gujars, a people who are found from the Nerbudda River in India as far up as Yassin and Chitral and through Kashmir and Swat, and who in Yaghistan have many peculiar and interesting customs. After losing the greater part of his belongings, which had been temporarily deposited beneath a rock, and were subsequently overwhelmed by an avalanche, the "Mullah" continued his explorations, examining the course of the Kandia River and its tributaries. The chief produce of the Kandia or Gabrial Valley consists of timber and ghee, both of which are largely exported to Peshawur. Indian corn is grown extensively, and wheat and barley to some extent, but no rice. On reaching the Indus River the "Mullah," instead of following its course as he had previously done, journeyed by a road leading across the mountain spurs which descend to the river from the north-west, and by this means he has been enabled to map out very fairly the entire western watershed of the Indus River from its junction with the Kandia to Buner. At the Kana Dara, about half-way down the course of the river, he passed the boundary between the Kohistanis and the Afghans, the inhabitants of Kana Dara and the lateral valleys below it resembling in appearance and manners the generality of Pathans. The lowest point in the Indus Valley to which the "Mullah" went was a *ziarat* (shrine) just below Kabalgram. From thence, instead of continuing his way into British territory, which was tolerably close, he explored the Itai and Ghorband valleys, and crossing over into the Swat Valley, took his Swat followers back to their homes before returning to Peshawur.

The general results of this important journey may be summed up as follows:—A survey of the entire Swat Valley, of the Kohistan above it, and of the Kandia Valley, a reconnaissance of the passes separating the two latter and those leading into the Panjkora Valley and northwards to Yassin, and a survey of the western watershed of the Indus from its junction with the Kandia to Buner. Major Tanner, whose surveys in Kafiristan and Gilgit have given him a knowledge of the region, remarks of the water-parting, separating the northernmost tracts surveyed by the "Mullah" (Ushu or Bashkar and the Upper Kandia Valley) from Mastuj and Yassin, that this ridge, which rises abruptly in great scarps from the banks of the Indus at Bunji and runs westward to the Kunar, is a very important geographical feature, as it separates the rainless tracts of Gilgit, Hunza, and Yassin, to the north, from the well-watered countries of Bashkar and Swat. On the north the vegetation is limited to a narrow belt, the general altitude of which may be set down at from 9500 to 12,500 feet, in which grow thinly scattered *Pinus excelsa*, *Abies Smithiana*, *Cupressus torulosa*, birch, &c., while to the south the forests are described as magnificent, and characterized by a profusion of deodar. In another particular the range is one of importance, as it forms approximately the great boundary line between the Shiah and Suni religions, but few of the latter sect being found north of it. Major Tanner records his opinion that the Dard group of languages includes no less than eight subdivisions, viz. Kafiristan, Lughmani and Dari Nuri, Damaineh, Chugani, Bashkari, Kashkari, the Ghus languages (including those of Hunza and Nagyr, Yassin, Ponyal, Gilgit, Tanjir, Darel, and Gujars), and those of the Yashkanis or Kolais.

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* Major Tanner remarks that the fall of snow in October 1877, throughout Kashmir, Gilgit, and Northern Afghanistan, was greater than remembered by the oldest inhabitant, while the avalanches had caused an extraordinary amount of injury.

The Estuary of the Yang-tsze-kiang.—In reference to a passage in our report on Admiralty Surveys during the past year, intelligence has just been received from Shanghai that the recent survey of the Yang-tsze-kiang at the mouth of the Hwangpoo or Woosung River, under Captain Napier in H.M.S. *Magpie*, is likely to result in considerable practical benefit to navigation, and particularly as regards vessels in the northern trade. The surveyors are stated to have found a navigable channel south-east of Grass Island, which will connect the present north and south channels, and save about 15 miles to vessels running to and from the north of China.

Mr. W. H. Tietkins' Journey in South Australia.—Our Associate, Mr. Tietkins, has recently returned to Adelaide from the expedition to which we referred last November (vol. i. p. 723), and which was undertaken chiefly for the purpose of sinking for water between Youldeh (Oldea) and the Musgrave Ranges, with a view to pastoral settlement. From a preliminary report which he has drawn up, we learn some particulars respecting his journey. Travelling northwards from Youldeh, Mr. Tietkins ascended the line of hills which are about 10 miles distant and 1000 feet above it, and obtained an extensive view to the south and south-west, the enormous sand hummocks, amongst which Youldeh is situated, appearing to form part of the plain which extends far to the south. This range is intersected by deep valleys and hollows, densely covered with mallee and spinifex. Thirty miles further north the sand range gives place to open limestone country, which continues for 12 miles, when a sandhill formation again sets in; mulga scrub and grass, however, make it less disagreeable than the tract covered with mallee and spinifex. The sandhills continue to within 12 miles of a native well, which is about two miles south of two flat-topped hills in S. lat. 29° 15′ 40″. This well, which the natives called Punthi, is the drainage of water into a large granite basin below the surface, and is not by any means permanent. Mr. Tietkins says he was surprised, when about two miles south of Punthi, to find himself in a cleared line, as straight as if run with a theodolite, which had evidently been made by the blacks in imitation probably of the line of verification which they had seen Mr. Cornish laying down in the south. Leaving the well, and travelling N. 35° W. over low stony hills, composed of a ferruginous conglomerate, Mr. Tietkins, after 23 miles' march, reached a native dam, called Winderaboi, where he found a fair supply of water. The vast extent of tertiary formation that reaches southwards to the seaboard, ends, he says, at these hills, and there is a pleasant change in the aspect of things; game is more abundant, grass is plentiful, and there is evidence of a large native population. These hills are called the Leisler Hills, and were discovered by Mr. Tietkins during Mr. Giles' expedition, but have not since been visited. Mr. Tietkins reports that the country for 70 miles west and west-north-west of Youldeh is covered with spinifex, mallee, and sand hummocks, and that at that distance he found the view to the west sufficiently discouraging to induce him to return. The elevation above sea-level was 900 feet, and Mr. Tietkins is firmly of opinion that there is an uninterrupted rise in the country, from the latitude of Youldeh to that of the Musgrave and Mann Ranges. In conclusion, he expresses a belief that, although efforts to find water have not hitherto been very successful, the route he followed will be "one of the busy highways to the mountain ranges of the interior, for the grazing capabilities of which we have the assurances of Gosse, Forrest, and Giles, but of the mineral wealth of which we know at present nothing."

Geographical Department, British Museum.—The Annual Return of the British Museum, which was published by order of the House of Commons in the early part of June, includes a report by Mr. R. H. Major, F.S.A., the Keeper of the Department, on the progress made in the arrangement and cataloguing of the maps, charts, plans, and topographical drawings, together with an account of the accessions made in the year 1879. The number of maps which were received under the Copyright Act in the course of the year was 520, in 1886 sheets, in addition to 8 atlases and 2 parts of atlases; 154 atlases and 979 maps, in 4128 sheets, were obtained by purchase; and 15 volumes and 652 maps and drawings, in 703 sheets, were presented. Besides the students who consulted maps and atlases in the reading room, 256 persons visited the department during the year for the purpose of making special geographical inquiries. Among the more interesting acquisitions of the year, Mr. Major calls attention to the following:—A large English chart, on parchment, of the coasts of Brazil and Africa, of the early date of 1647, bearing the legend: "Made by Nicholas Comberford, dwelling neare to the West end of the Schoole House, at the X X signe of the Plat in Radcliffe, anno 1647." Two illuminated and gilt MS. maps, on parchment, by José da Costa Miranda—one of the coasts of Florida, New Spain, and Africa, 1688, and the other of the West Indies, 1698. A most important plan of Paris, by Verniquet, in 72 sheets, the result of thirty years' labour, and finished in 1791; it is full of interest, as showing the city before the period of the demolition of a great number of convents, churches, and other notable buildings. Also a reproduction, by the Italian Ministry of Public Instruction, of a drawn plan of Rome in the middle of the tenth century by Leonardo Bufalini, found in the Convent of the Madonna degli Angioli in Cuneo, when it became the property of the Italian Government. This has been chromolithographed by Bruno Salomone, and published at Rome, in 12 sheets, during the past year.

Preliminary Survey of Pêrak.—Mr. Henry S. Deane, C.E., of Ceylon, acting under instructions from the Colonial Secretary of the Straits Settlements, has made various journeys into the interior from Lârut, during the early summer of last year, in the course of which he has procured many bearings and observations, preliminary to contemplated surveys, and has collected much information as to the capabilities of the country.

After fixing the site of the points of the first triangulation series at Kwala Kangsa, Mr. Deane visited Kinta, crossing the Meru Range, and spending several days on the summit of Bujong Malaka (3800 feet), from which he commanded the main ridge, whence rise the Chenderiang, Kampar, Batang Padang, and Bīdor rivers. Bearings on various important ranges, with angles of elevation and depression, were here procured, especially on the chief peaks of the Slim Mountains, which are close to the Slim and Bernam rivers, at the extreme south-east corner of the State, and attain a considerable height (probably 6000 to 7000 feet).

Returning to Kinta, Mr. Deane left the usual track at Chumor, and striking north-east reached a Sakei village called Kampong Langkor, on Sungei Kĕrbau, a tributary of the Plus River, rising on the north-western slopes of Mount Rayam. No European having previously visited this locality, he had some difficulty in inducing the villagers to guide him to a good sight-point, as they conscientiously refused to go beyond the limited range of their own personal travel; but on the morning of the second day a proper summit was found in Gûnong Asal, which, when cleared, will command observations on the various mountains forming the Titi Wangsu Range on the extreme northern boundary, and a magnificent view of the main ridge above mentioned at Bujong Malaka, forming the eastern limit of Pêrak to the north of Mount Rayam.

Gûnong Asal is 38 miles almost due east from Mount Pondok, and overlooks the vast Ulu Plus Valley, which extends in a north-westerly direction. From its summit, for from six to 12 miles into the valley of the Plus, there is a continuous elevated group of parallel ranges, from 1000 to 3500 feet high, inclining in a north-westerly direction from its eastern spur.

Returning to Kampong Langkor, Mr. Deane then followed the Sungei Kĕrbau to its junction with the Plus, ascending the latter as far as it was navigable for boats with light draught. He states it to be a very fine river, capable of much improvement, should there be sufficient traffic developed to justify a moderate expenditure, though several of its rapids are tedious, notably the Jeram Dina rapid, some 50 miles up, which prevented his further ascent, though beyond it the river seemed broad and deep for a considerable distance. The Plus valley is apparently exceedingly rich in tin deposits; the soil of Mount Asal is stated to be very superior and well adapted to coffee growing, and that of the valley itself to be no less so for most tropical low country products.

Mr. Deane's next journey through the State commenced at Thaiping, and led him across the upper waters of the Kûrau, Hījau, and other rivers to Kwala Sĕlâma, from which place he ascended the Sĕlâma by boat as far as it was navigable, ultimately reaching Gûnong Inas, one of the most southerly points of the Titi Wangsu Range before mentioned, with a probable maximum elevation of 7000 feet. Here he remained several days, obtaining a complete arc of horizontal and vertical angles. Descending this mountain, he struck northwards to the Krian River, and taking boat from its highest navigable point, followed its course to the boundary of Province Wellesley at Parit Buntar, thence reaching Thaiping viâ Penang. Mr Deane's further purely professional operations were carried on in better known districts.

As a preliminary to some practical observations as to the extent of land available for plantations, Mr. Deane's estimate of the gross superficial area of the State (7949 square statute miles, or 5,087,597 imperial acres, omitting fractions) has to be based upon an assumption of its exterior eastern boundary on the section from Jeram Panjang on the Pêrak River east and south to the source of the Bernam, as yet not accurately defined. On this estimation, there is an area of 1,451,770 acres, from 1000 to 8000 feet, available for cinchona, coffee, tea, &c., with 588,422 acres suited to lower cultivation, such as Liberian coffee, besides various isolated but extensive tracts. The soil examined, both on the ranges and low lands, is considered to be equal, if not superior, to that of estates found highly remunerative in Ceylon for similar purposes. This was especially the case at Mount Asal and Mount Inas; and fine limestone abounded in the Titi Wangsu and Plus ranges, and in Kinta. The soil was better on the eastern than on the western watershed of the coast ranges, and apparently improves further in-country. Vast tracts of magnificent land well adapted for paddy cultivation seem entirely neglected by the natives, though the river system already available leaves little to be desired, either for transport or irrigation purposes. There are now from 1200 to 1300 miles of water transport, capable of great extension and improvement with a comparatively small outlay; and when land carriage is ultimately required, it is believed that narrow-gauge steam tramways would best meet the requirements of the country, as valuable tin deposits occur throughout the low lands, and local traffic is certain. A river survey accompanying the proposed general trigonometrical survey is, however, urged as of immediate importance in assisting the location of productive estates.

Mr. Deane, from his experience in other parts of the Straits, is confident that Pêrak excels in the extent, quality, and suitability of its forest lands available for plantations, and he considers that the Dindings is likely to be its principal port for exportation.

THE ANNIVERSARY MEETING, May 31st, 1880.

The Right Hon. the Earl of Northbrook, G.C.S.I., President, in the Chair.

Elections.—*The Earl of Kimberley (Secretary of State for the Colonies); Percy Lloyd, Esq.; A. H. Mason, Esq.; John Stedman, Esq.; W. A. Tyssen Amherst, Esq., M.P.*

The Regulations for the government of anniversary meetings and the proceedings of the meeting of last year were read by Mr. C. R. Markham, Secretary.

The President then nominated as Scrutineers of the ballot about to take place Rear-Admiral R. C. Mayne, C.B., and A. G. Henriques, Esq., and requested Mr. Markham to read the Annual Report of the Council, which was as follows:—

REPORT OF THE COUNCIL.

The Council have the pleasure of laying before the Fellows the following Report on the financial and general condition of the Society:—

Members.—The number of Fellows elected during the past year (ending April 30th, 1880) was 207, besides two Honorary Corresponding Members. In the previous year, 1878–9, the total elections of Fellows numbered 170; in 1877–8 the number was 187. The losses in the past year have been, by death 67, by resignation 48, and by default of subscription 36, making the net increase for the year, 58. In the year

1878–9 the net increase was 2; in 1877–8, 49; in 1876–7, 138; in 1875–6, 149. The Society has lost by death one Honorary Corresponding Member.

Finance.—As will be seen by the annexed Balance Sheet, the total net income for the Financial year ending 31st December, 1879 (exclusive of balance in hand) was 8979*l.* 14*s.* 10*d.*, of which 6182*l.* consisted of entrance fees and subscriptions of Fellows. In the previous year, 1878, the total net income was 8124*l.* 10*s.*, and the amount of subscriptions, &c., 6017*l.*; in 1877, 7950*l.* 1*s.* 11*d.* and 6099*l.*; in 1876 8611*l.* 11*s.* 8*d.* and 7109*l.* 11*s.* The amount of total net income just stated for the past year included a legacy of 500*l.* from the late Sir W. C. Trevelyan. A legacy of 540*l.* formed also part of the stated income for 1878.

The net expenditure for the past year (exclusive of investments and balance in hand) was 6990*l.* 14*s.* 2*d.* The net expenditure in 1878 was 6361*l.* 9*s.* 6*d.*; in 1877, 5940*l.* 17*s.* 11*d.*; in 1876, 6870*l.* 13*s.* 1*d.*, and in 1875, 5683*l.* 4*s.* 10*d.* The sum of 1551*l.* 10*s.* 10*d.* was invested during the year.

The Finance Committee of the Council have held, as usual, Monthly Meetings during the year, supervising the accounts of the Society. The Annual Audit was held on the 14th and 16th of April last, the Auditors being, on behalf of the Council, Sir Henry Barkly and Sir Rawson W. Rawson; and on behalf of the Fellows at large, Sir Charles Nicholson, Bart., and S. P. Low, Esq. The cordial thanks of the Council and Fellows are due to these gentlemen for having freely devoted their valuable time to this important task. At the end of their labours the Auditors drew up the following Report to the Council:—

"The Auditors appointed for the examination of the Accounts of the Royal Geographical Society for the year ending 31st December, 1879, beg to report that they have examined the Balance Sheet submitted to them, and compared it with the Cash Book, Bankers' Book, Petty Cash Book, 'Proceedings' Advertisement Books, and other books of account kept by the Society, and have verified the Balance in the Bankers' Pass Book and in the hands of the Accountant, checked the entries in the Cash Book, and examined all the vouchers for payments made, and that they have found the same to be correctly stated and sufficiently vouched.

"They have also had produced to them a letter from the Deputy Accountant of the Bank of England, and from Messrs. Cocks, Biddulph, and Co., Bankers, showing that the following investments were standing to the credit of the Society, on the 31st December, 1879:—

	£	*s.*	*d.*
India 5 per cent. Stock	1000	0	0
India 4 per cent. Debenture Stock	500	0	0
Great Western Railway 4½ per cent. Debenture Stock	1800	0	0
London and North-Western Railway 4 per cent. Debenture Stock	1000	0	0
North-Eastern Railway 4 per cent. Debenture Stock	1000	0	0
Great Indian Peninsula Railway Guaranteed 5 per cent. Capital Stock	4000	0	0
March Exchequer Bills	1000	0	0
Caledonian Railway 4 per cent. Preference Stock, No. 1	2000	0	0
Consols (Lambert Donation)	526	6	4
Consols	4214	0	6

"The Subscription Register, showing the sums payable by the Fellows of the Society, has been duly kept up, and the arrears outstanding at the close were 1475*l.* and the auditors include this item in the assets of the Society as worth 737*l.* 10*s.*

"The Investments and Assets of the Society on the 31st December, 1879, exclusive of the Map Collection and Library, amounted to 39,235*l.* 11*s.* 3*d.*

"The Auditors have pleasure in certifying that the accounts, books, and vouchers were in a highly satisfactory condition.

"Rawson W. Rawson,
"Henry Barkly,
"Charles Nicholson,
"S. P. Low,
} *Auditors.*

"16th April, 1880."

Receipts. BALANCE SHEET FOR THE YEAR 1879. *Expenditure.*

1879.	£	s.	d.	£	s.	d.
Balance in Bankers' hands 31st Dec. 1878	999	13	0			
Do. Accountant's do.	20	11	7	1,020	4	7
Subscriptions:—						
For the current year ..	3,759	0	0			
Paid in advance	533	0	0			
Arrears..	526	0	0	4,818	0	0
Entrance Fees	..		..	570	0	0
Life Compositions.. ..	..		..	794	0	0
Payments paid in error ..	..		..	111	1	3
Legacy by Sir W. C. Trevelyan, Bart. ..	..		..	500	0	0
Parliamentary Grant ..	..		..	500	0	0
Royal Premium	..		..	52	10	0
Rent of Shop and Vaults	..		..	140	0	0
Publications, Sale of, and Advertisements	..		..	804	10	5
Loan of Diagrams	..		..	4	4	0
Payments for Scientific Instruction	..		..	20	2	6
Dividends:						
North-Eastern Railway 4 per Cent. Debenture Stock.. .. 1000*l.*	39	3	4			
India 5 per Cent. Stock 1000*l.*	48	19	2			
India 4 per Cent. Debenture Stock 500*l.*	9	15	10			
Great Indian Peninsula Railway 5 per Cent. Stock .. 4000*l.*	227	3	4			
Great Western Railway 4½ per Cent. Debenture Stock (Davis Bequest) .. 1800*l.*	74	18	2			
London and North-Western Railway 4 per Cent. Debenture Stock (Murchison Bequest) 1000*l.*	39	3	4			
Exchequer Bills 1000*l.*	31	16	6			
Caledonian Railway 4 per Cent. Preference Stock .. 2000*l.*	78	6	8			
Consols 4740*l.* 6*s.* 10*d.*	116	0	4	665	6	8
			£	9,999	19	5

1879.	£	s.	d.	£	s.	d.
House:—Taxes and Insurances, Repairs, Improvements and Furniture, Coal, Gas and Water-rates, &c... ..	..		..	322	7	1
Office:—Salaries and Gratuities, Stationery and Printing, Postages and Parcels, &c...	..		..	1,514	12	6
Library:—						
Salaries, Books, &c. ..	..		..	436	9	7
Map-Room:—						
Salaries and Gratuities, Maps, &c...	..		..	1134	18	5
Meetings..	..		..	157	0	2
Scientific Purposes Grant:—						
Lecturers' Fees and Instruction to Travellers	..		..	111	19	0
Medals and other awards	..		..	134	10	0
Publications:—Printing Journal and Proceedings, Maps and Illustrations, &c.	..		..	3,099	14	2
Payments in error returned	..		..	79	3	3
Investments:—						
Purchase of 1071*l.* 4*s.* 8*d.* Consols	1,040	0	0			
Purchase of 500*l.* India 4 per Cent. Stock ..	511	10	10	1,551	10	10
Balance in Bankers' hands 31st Dec. 1879 (less cheque 10*l.* 8*s.* 4*d.* not presented)	1,435	17	6			
Do. Accountant's Do.	21	16	11	1,457	14	5
			£	9,999	19	5

REGINALD T. COCKS,

Treasurer.

Audited and found correct, the 16th day of April, 1880.

HENRY BARKLY,
RAWSON W. RAWSON,
CHAS. NICHOLSON,
S. P. LOW,
} *Auditors.*

STATEMENT showing the RECEIPTS and EXPENDITURE of the Society from the Year 1848 to the 31st Dec., 1879.

In 1856 a Treasury Grant of 1000*l.* for the East African Expedition received.

In 1860 a Treasury Grant of 2500*l.* for the East African Expedition received.

In 1869 Legacy of Mr. Benjamin Oliveira, 1506*l.* 17*s.* 1*d.*

In 1870 Legacy of Mr. Alfred Davis, 1800*l.*

In 1871 Legacy of Sir Roderick Murchison, 1000*l.*

In 1872 Amount of Mr. James Young's Grant for the Livingstone Congo Expedition, 2000*l.*

In 1874 Amount of Mr. James Young's Grant for the Livingstone Congo Expedition, 1041*l.* 14*s.*

In 1876 Special Parliamentary Grant of 3000*l.* towards the Expenses of the Cameron Expedition.

In 1877 Donation of 500*l.* by Mr. C. J. Lambert in carrying out the provisions of his father's will.

In 1878 Legacy of Admiral Sir George Back, 540*l.*

In 1879 Legacy of Sir W. C. Trevelyan, 500*l.*

Year.	Cash Receipts within the Year.			Cash Amounts invested in Funds.			Deducting Amounts inv in Funds; ac Expenditu		
	£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	
1848	696	10	5	..		..	755	6	[illegible]
1849	778	3	0	..		..	1,098	7	[illegible]
1850	1,036	10	5	..		..	877	2	1
1851	1,056	11	8	..		..	906	14	[illegible]
1852	1,220	3	4	..		..	995	13	[illegible]
1853	1,917	2	6	..		..	1,675	6	[illegible]
1854	2,565	7	8	..		..	2,197	19	[illegible]
1855	2,584	7	0	..		..	2,636	3	[illegible]
1856	3,372	5	1	533	10	0	2,814	8	7
1857	3,142	13	4	378	0	0	3,480	19	9
1858	3,089	15	1	..		..	2,944	13	6
1859	3,471	11	8	950	0	0	3,423	3	9
1860	6,449	12	1	466	17	6	5,406	3	7
1861	4,792	12	9	1,358	2	6	3,074	7	4
1862	4,659	7	9	1,389	7	6	3,096	19	4
1863	5,256	9	3	1,837	10	0	3,656	4	0
1864	4,977	8	6	1,796	5	0	3,647	7	10
1865	4,905	8	3	1,041	5	0	4,507	4	5
1866	5,085	8	3	1,028	15	0	4,052	15	0
1867	5,462	7	11	1,029	0	6	3,943	17	4
1868	5,991	4	0	1,857	3	9	4,156	17	10
1869	6,859	16	0	2,131	5	0	4,646	0	8
1870	8,042	6	1	3,802	6	0	3,845	10	6
1871	6,637	3	7	1,000	0	0	3,726	4	4
1872	8,119	7	9	1,999	4	6	5,871	13	2
1873	7,761	18	10	2,015	1	8	6,697	12	6
1874	8,753	5	10	499	0	0	7,876	2	3
1875	7,934	15	10	2,002	7	6	5,683	4	10
1876	11,611	11	8	..		..	6,870	13	1
1877	7,950	1	11	2,538	2	0	8,940	17	11*
1878	8,124	10	0	3,000	0	0	6,361	9	6
1879	8,979	14	10	1,551	10	10	6,990	14	2

* This sum includes the Special Parliamentary Grant transferred to the Cameron Expedition Fund in February, 1877.

STATEMENT OF ASSETS—31st December, 1879.

			£	*s.*	*d.*
Freehold House, Fittings, and Furniture, estimated (exclusive of Map Collections and Library insured for 10,000*l.*)		..	20,000	0	0
Investment (amount of Stock), as detailed in the above Report of the Auditors		..	17,040	6	10
Arrears due on December 31, 1879 .. .. £1,475 Estimated at			737	10	0
Balance at Bank	1,435 17 6				
„ in Accountant's hands	21 16 11		1,457	14	5
Total			£39,235	11	3

Publications.—The new monthly series of the 'Proceedings' has been continued with regularity since its commencement in January last year, and the first volume, comprising 840 pages and 19 maps, was completed in December. Sir Rawson W. Rawson has drawn up, on behalf of the Publication Committee, complete statistical tables regarding the volume, of which the following is a condensed summary. It will be seen that the result of the new publication, which appears to have given much satisfaction to the Fellows and the geographical public, is, from a financial point of view also, very satisfactory:—

	New Series, 1879.						Old Series. Average of Vols XX. and XXI.		
	Estimated Cost.			Actual Cost.					
	£	s.	d.	£	s.	d.	£	s.	d.
Cost of production, including Printing, Maps, &c	1771	0	0	1891	12	0	609	0	0*
Delivery to Fellows, Honorary Corresponding Members, and Foreign Societies, including the cost of printed Address-Bands	330	0	0	339	15	0	154	0	0
£	2101	0	0	2231	7	0	763	0	0

* As maps were not often given in the old series, no charge is here included on that account.

The increased cost of issuing the 'Proceedings' in the new monthly form was, therefore, for the year, apparently 1468*l.* 7*s.*, against which may be set the diminished cost of production of the 'Journal,' amounting to about 250*l.*, and due to the changed mode of publishing the maps. The net receipts from sales to the public and from advertisements are considerably more than was anticipated, having amounted to 662*l.* 14*s.* 7*d.*, against an estimated return of 350*l.* The actual increase in the expenditure, caused by the issue of the new monthly publications, was really about 550*l.*, due chiefly to the increased cost of delivery of the twelve numbers, and against which may be placed the value of the stock on December 31st, 1879.

Expeditions and Grants of Instruments to Travellers.—A third grant of 500*l.* was made during the year 1879 to the African Exploration Fund, to provide for the further expenses of the expedition sent out under Mr. Keith Johnston to Lakes Nyassa and Tanganyika. In June the leader died, and the command devolved upon Mr. Joseph Thomson, his geological assistant, who has since carried out the main objects of the expedition in a satisfactory manner. The grant just mentioned was not actually called for until the present year, and therefore does not appear in the balance sheet for 1879: another grant of 500*l.* has since been made for 1880.

Instruments to the value of 249*l.* have been supplied to travellers, as follows:—Rev. W. P. Johnston, East Africa, 35*l.* 5*s.*; Mr. E. Delmar Morgan, for his journey to Central Asia, 15*l.* 15*s.*; Surgeon-Major J. E. T. Aitchison, for measurements of heights in Afghanistan, 24*l.* 11*s.*; Mr. A. McCall, for his journey to the Upper Congo, 33*l.* 3*s.*; Captain T. L. Phipson-Wybrants, for his expedition to the interior of East Africa, 109*l.* 15*s.*; Dr. W. R. Peden, for measurements of heights in the district of Blantyre on the Shiré, 30*l.* 13*s.* The income derived from the Murchison and Back bequests has been applied towards defraying the cost of the foregoing.

Annual Grant for Scientific Purposes.—The science lectures were discontinued at the end of the last session, after a trial of three years. In their place the Council sanctioned a scheme, prepared by the Scientific Purposes Committee, for giving practical instruction to intending travellers in the use of instruments for astronomical observations to fix positions, in surveying, and in the measurement of heights by barometric and hypsometrical methods. Mr. Coles, the Map Curator, was appointed the instructor, and the operations were commenced during the summer. The lessons are given in the Society's building, and when necessary (as in the case of surveying) in the country, and it was arranged that the Society should pay half the fees of the pupils. The result of this attempt to improve the scientific training of the many travellers who annually leave our shores for distant and little-known regions is so far very encouraging. The number of pupils has been thirteen, and of these two have since left for the interior of China, one for Afghanistan, three for Central Africa, one for Central Asia, and one for Armenia and Kurdistan. Two new pupils were entered this month, and five altogether are now under instruction.

In order to facilitate the instruction in astronomical observations, an observatory has been built at a cost of 151*l.* 16*s.* 6*d.*, on the roof of the Society's house, under the superintendence of Mr. James Fergusson, and is now in constant use. A telescope of the value of 30*l.* will soon be added to the observatory.

The Map of Equatorial Africa, on the scale of 15·8 miles to an inch, which is being compiled by Mr. Ravenstein, under the direction of the Scientific Purposes Committee, is approaching completion, and it is expected that the lithographed sheets will be ready in the course of the summer. The original map, on a much larger scale than the printed sheets, will be placed in the Map Room, when completed, for general reference. An analytical catalogue of published works on African Travel and Geography (including papers in Transactions and periodicals), which Mr. Ravenstein is compiling *pari passu* with the map, will be delivered at the same time. The map and catalogue are to cost when complete 210*l.*

The Committee have had under consideration the construction of terrestrial globes to illustrate the physical geography of the earth's surface; and in order to encourage the production of educational instruments of so much importance as these are likely to prove, they have commissioned Sir J. H. Lefroy to superintend the outline engraving of two experimental gores, each of 30° on either side of the meridian of Greenwich, for a globe 32 inches in diameter, the drawings to be afterwards submitted to scientific authorities for filling up with details. The sum of 20 has been placed at Sir J. H. Lefroy's disposal for this experiment.

Library.—683 books and pamphlets have been added during the past ye 569 (including all the pamphlets) by donation or exchange, and 114 by purcha As regards donations, it may be observed that the presentation of new works publishers, with the object of obtaining notice in the Bibliography of the new seri of 'Proceedings,' is beginning to become an appreciable source of increase.

Forty-six pamphlets and small works have been put into covers on the Societ premises, and 199 volumes have been bound.

The sum of 142*l.* 5*s.* 2*d.* has been expended in purchasing books, and the further sum of 56*l.* 11*s.* 3*d.* in binding for the Library.

As the possibility of adding large works has been much diminished by purchases and donations during the last six years, increase in the Library is chiefly to be expected in periodical literature exclusively or partially bearing upon geography. Of the publications of purely geographical associations, there are now received those of the Societies of Antwerp, Belgium, Bern, Bordeaux, Bremen, Cairo, Darmstadt, Denmark, Dresden, Frankfort, Geneva, Halle, Hamburg, Holland, Italy, Languedoc, Leipzig, Lisbon, Lyons, Madrid, Marseilles, Metz, Mexico, Munich, New York, Normandy, Oran, Paris, Rochefort, Roumania, Russia (with branches), and Vienna (32 in all); besides the periodical issues of various publications specially devoted to geography, such as Petermann's 'Mittheilungen,' 'Das Ausland,' 'Cosmos,' 'L'Exploration,' 'Le Tour du Monde,' 'Deutsche Rundschau für Geographie,' 'Geographische Nachrichten,' 'Zeitschrift für wissenschaftliche Geographie,' 'La Géographie contemporaine,' 'Aardrijkskundig Weekblad,' &c.; with others, such as the 'Oesterreichische Monatsschrift für den Orient,' 'Annales de l'extrême Orient,' 'Missions Catholiques,' &c.; into which geographical matter largely enters. Especial attention is also given to acquiring and keeping up the publications of Societies and other periodicals bearing upon subjects connected with geography; and the Library is becoming more extensively consulted both by Fellows and their friends as this source of information gets known, in addition to the usual references for purely geographical purposes.

Among the more important accessions are:—Eden's 'History of Trauayle,' 1577; Hakluyt's 'Principall Navigations,' 1589 (presented by C. R. Markham, Esq.); Hakluyt's 'Voyages,' 1592–1600; Borne's 'Regiment for the Sea,' 1596, and Blundeville's 'Exercises,' 1613 (presented by C. R. Markham, Esq.); Brugsch Bey's 'Dictionnaire Géographique de l'Ancienne Égypte'; the whole of the geographical works, 103 volumes, including many relating to the Faroe Islands, contained in the library of the late Sir W. C. Trevelyan, and bequeathed by him to the Society; a collection of 40 volumes on physical and historical geography, &c., all new to the Library (presented by W. D. Cooley, Esq.); a collection of 14 volumes, by Mendonça, Almeida, Ribeiro, Monteiro, and others, on the Portuguese Colonial possessions; Hunter's 'Statistical Account of Assam,' 'Conybeare and Atkinson's 'Gazetteer of the North-Western Provinces,' in five volumes, Max Müller's 'Sacred Books of the East,' in three volumes, Medlicott and Blanford's 'Geology of India,' 'Account of Operations of the Great Trigonometrical Survey of India,' vols. ii., iii., and iv., 'The General Report and Abstracts of Surveys, for 1877–78,' and other minor publications (presented by H.M. Secretary of State for India, to whose department the Library continues to be indebted in the highest degree for unceasing and valuable support; the continuation of the Memoirs and other publications of the Geological Survey of India (presented by the Indian Government, per Dr. Oldham); the 'Publications de l'École des Langues Orientales vivantes,' vols. iv., vi., vii., viii., ix., and xii. (presented by the French Minister for Public Instruction); Ujfalvy de Mezö-Kövesd's 'Expédition Scientifique française en Russie, en Sibérie, et dans le Turkestan'; Brough Smyth's 'Aborigines of Victoria,' with many Reports on Statistics, &c., of the Colony (presented by the Victorian Government); Deguigne's 'Histoire générale des Huns'; Hall's Narrative of his Second Arctic Expedition' (presented by the U.S. Naval Observatory); Marsilli's 'Natuurkundige Beschryving der Zeen' (presented by Commodore Jansen); Wiener's 'Pérou et Bolivie' (presented by Messrs. Hachette); Gill's 'River of Golden Sand' (presented by the Author); 'Encyclopædia Britannica,' 9th edition, vol. x. (presented by Messrs. A. and C. Black); the current Reports and other publications of the U.S. Geographical and Geological Surveys under Hayden, Powell, and Clarence King (presented by the heads of the respective Surveys); vol. v. of Reclus's 'Géographie Universelle' (presented by the Author); a set of the 'Transactions of the Bombay Geographical Society' (presented by Mrs. Constable); Junghuhn's 'Java'; Bunbury's 'History of Ancient Geography' (presented by the Author); Brown's 'Races of Mankind,' all as yet published of Cassell's 'Natural History' and the 'Countries of the World,' with other works on geographical subjects, as selected by the Librarian from the Catalogue of Messrs. Cassell, Petter, and Galpin (presented by the Publishers); Day's 'Fishes of India,' vols. i. and ii. (presented by the Author); Stanford's 'Compendium of Geography and Travel' (Africa, Central and South America, and Australia), and Keith Johnston's 'Geography, Physical, Historical, and Descriptive' (presented by Mr. Stanford); the continuation of Burmeister's 'Description physique de la République Argentine' (presented by the Author); and the commencement of Schlagintweit's 'Indien in Wort und Bild.'

The transcript of titles for the proposed second Supplement to the Alphabetical Catalogue will soon be ready for printing. It is intended to include the acquisitions of 1880, so as to cover a decade, the first supplement ending with the acquisitions of 1870.

Map Room.—The accessions to the Map-Room Collection since the last anniversary meeting comprise 692 Maps and Charts on 1795 sheets; 12 Atlases, containing 1067 sheets, and 149 views, photographs, &c. Of these, 33 Maps on 389 sheets and

3 Atlases have been purchased. The accessions of the present year are in excess of those of last year by 224 Maps on 369 sheets. 16 new Diagrams have been constructed on the premises.

Among the most important additions to the Map-Room Collection are:—80 Sheets of the Ordnance Survey of the British Isles, on various scales (presented by the First Commissioner of Works, through the Director-General of the Ordnance Survey). 140 Charts of the British Admiralty (presented by the Lords Commissioners of the Admiralty, through the Hydrographer). 78 French Admiralty Charts (presented by the Dépôt des Cartes et Plans de la Marine). 4 Sheets of United States Charts (presented by Captain Franklin, U.S.N., Hydrographer to the Bureau of Navigation). 16 Sheets of Indian Marine Survey Charts (presented by the Superintendent of the Indian Marine Survey). 2 Charts of the Russian Hydrographic Office (presented by the Russian Hydrographic Department). 290 Sheets of the various Indian Government Surveys (presented by H.M. Secretary of State for India). General Atlas in 11 vols. by Joan Bleau, published at Amsterdam, 1665 (presented by the Right Hon. the Earl of Northbrook). 12 cases containing 68 Sheets of the Ordnance Survey, taken from the original copper-plates of dates prior to 1824, 1-inch scale (presented by General Sir J. H. Lefroy). Stieler's Hand-Atlas, new edition, and Spruner's Hand-Atlas, as well as 19 Maps published in Petermann's 'Geographische Mittheilungen' (presented by Herr Justus Perthes). Parts XIII. and XIV. of the Topographischer Atlas der Schweiz (presented by the Chief of the Federal Survey, Berne). 17 Maps (presented by the Intelligence Branc of Quartermaster-General's Department). 4 Charts (presented by the Danish Hydr graphic Office). Karte des Rhein-Stroms (presented by the Royal Prussian Minist for Public Works, through the German Ambassador). 10 Sheets of the Geologic Survey of Sweden (presented by the Director of the Swedish Geological Survey).

Special attention is drawn to the 10 cases containing 211 of the principal Maps published by Mr. Edward Stanford, which have been presented to the Society by Mr. Stanford.

The Maps in the Society's Collection have been made frequent use of by the Fellows, public officers, and the general public; and the large Maps have been lent for the purposes of illustrating lectures at public institutions, as well as to private individuals.

The new Catalogue of Maps having been copied out in separate titles, and for the most part revised, is at the present time being arranged alphabetically and made ready for printing.

The adoption of the above Report, after being moved and seconded, was passed unanimously by the Meeting.

PRESENTATION OF THE ROYAL MEDALS.

The Royal Medals of the year for the Encouragement of Geographical Science and Discovery had been awarded by the Council as follows:—

The Founder's Medal to Lieutenant A. Louis Palander, in recognition of the services rendered by him to geography, as Commander of the *Vega* in the late Swedish Arctic Expedition under Professor Nordenskiöld, during which he safely navigated the ship along the unsurveyed shore of the Asiatic continent for nearly 3000 miles, and took the leading part in charting the coasts of Northern Asia.

The Patron's Medal to Mr. Ernest Giles, for having led four great expeditions and several minor ones in Australia, chiefly between the years 1872 and 1876, and making valuable route-surveys, geological and botanical collections, and publishing descriptions of all these journeys. The two most notable explorations were from Beltana to Perth, distance from east to west 2500 miles; and from Champion Bay to the

Overland Line of Telegraph, from west to east 2000 miles: according to the map by the Surveyor-General of Australia, representing Mr. Giles' four great explorations, 6000 miles were traversed, 20,000 square miles of which are coloured as newly discovered. Mr. Giles was honourably mentioned five times, for his discoveries and collections, in the Annual Addresses of the Royal Geographical Society, for the years 1873-4-5-6-7.

His Excellency Count PIPER, Swedish Minister, attended to receive the Medal on behalf of Lieutenant Palander. The PRESIDENT addressed him in these words:—

"Your Excellency,—On behalf of the Council of the Royal Geographical Society, I have to ask you to do them the favour of conveying to Lieutenant Louis de Palander the Founder's Gold Medal, which the Council of the Society have awarded him, in recognition of the services rendered by him to geography, as Commander of the *Vega* in the late Swedish Arctic Expedition, during which he safely navigated the ship along the unsurveyed shore of the Asiatic continent for nearly 3000 miles.

"In asking your Excellency to undertake this office on behalf of the Society, I am sure, both from the interest which the King of Sweden has personally taken in the recent expedition which under the guidance of Baron Nordenskiöld has achieved the feat of making the North-Eastern Passage for the first time, and from the keen interest which you yourself, to my own knowledge, feel in the progress of Arctic discovery, the task will be an agreeable one. Lieutenant de Palander, who, I need hardly say, was invited to attend our anniversary meeting to-day, has been prevented from accepting our invitation for a reason which is all-sufficient. He has been called upon for active service in the Royal Swedish Navy, and such obligations supersede every other engagement.

"I shall have occasion in the address which, in accordance with the usual custom, I shall have shortly to deliver upon the progress of geographical discovery for the past year, to allude to the voyage of the *Vega*. The perseverance, foresight, and high scientific qualifications of Baron Nordenskiöld are so well known and are so highly appreciated by all geographers, that I need not allude to them further than to state that the Council of the Royal Geographical Society recorded the following resolution, which I desire to place in your Excellency's hands, with the request that you will be so good as to transmit it to Baron Nordenskiöld:—

"'The completion of the North-East Passage under the initiation and direction of Baron A. G. Nordenskiöld is the greatest geographical event of the year, and the name of this distinguished geographer and explorer would undoubtedly have been proposed for the award of one of the Royal Medals for 1880, had he not already, in 1869, received a medal for the leading part he took in the Swedish expeditions to Spitzbergen of 1868 and previous years.

"'In acknowledgment of the eminent services to geography rendered by Baron Nordenskiöld, it is unanimously resolved that he receive the thanks of the Council of the Royal Geographical Society, and be elected an Honorary Corresponding Member.'

"Lieutenant de Palander since 1868 has been associated with Baron Nordenskiöld in the various expeditions which culminated in the achievement of the North-Eastern Passage; the command of the *Vega* was confided to him at the express wish of Baron Nordenskiöld. It is due to his high qualities as a sailor and as a commander that the *Vega* has passed safely through her adventurous voyage. He has had the singular good fortune of bringing back his whole crew without a single death having occurred among them. The track of the *Vega* passed close to the shores of the Asiatic continent for nearly 3000 miles of what may be considered unknown ground; for the charts of this region were, as might have been expected, deficient in every respect: incidental dangers and obstructions by close as well as drift ice and by fogs were frequently encountered; the general shallowness of the sea, so shallow as repeatedly to hazard the grounding of the ship, and to require piloting boats ahead, added materially to the anxieties of the situation. A thorough and a bold seaman was required for the enterprise; and Lieutenant de Palander has proved himself by its success deserving a high place among modern navigators. He is an accomplished geographer as well as a skilful navigator. His modest narrative, characteristic of the man, published in 'Blackwood's Magazine' for last March, must commend itself to geographers as alike clear and brief, and as embracing the salient points of this memorable expedition.

"Lieutenant de Palander has received from his Sovereign the rewards to which he is justly entitled, and I beg to offer to him through your Excellency my hearty congratulations, and to express the satisfaction of the Council that we have been able to enrol his name upon the list of the Medallists of the Royal Geographical Society."

His Excellency Count PIPER, having received from the President the Medal for Lieutenant Palander, a copy of the Resolution of the Council, and the Diploma of Honorary Membership for Professor Nordenskiöld, thus replied:—

"MY LORD, LADIES, AND GENTLEMEN,—It is my agreeable duty to receive on behalf of Baron Nordenskiöld and Captain de Palander these tokens of high distinction which the Royal Geographical Society has awarded to them, and to express their deep gratitude for the honours conferred upon them, and their regret that unavoidable circumstances have prevented them from being present on this occasion. In reply to the eloquent words with which His Lordship has accompanied the delivery to me of these honours, I think I cannot do better than read to you a translation of the speech addressed by His Majesty King Oscar to Baron Nordenskiöld and his companions of the *Vega* at the banquet given by His Majesty to them on their arrival at Stockholm.

"The crew of the *Vega* having entered the banquet hall at the close of the banquet, His Majesty proposed, in the following terms, a toast in honour of the *Vega's* voyage of discovery:—

"'Genius strikes out for itself new paths. Manly purpose and strong will break through all hindrances. Enterprise and prudence make newly-formed combinations sources of universal good.

"'Bartolomeo Diaz, Vasco di Gama, Christopher Columbus, Ferdinand Magelhäens, James Cook, and men of like stamp, travelled to new countries over unknown seas. The world's trade followed in their track—a messenger of wellbeing and civilisation.

"'But while new portions of the globe were lit up by the torches of discoverers, clouds and darkness rested still upon a portion of the ancient world. The fetters of polar ice lay yet unbroken on the north coast of that very part of the globe which has been spoken of as the cradle of the human race.

"'It has been reserved as a privilege for our own times to break many of its icy fetters, and that flag of Sweden which we love waves high over the first ship that has sailed round Asia.

"'The entire civilised world, at times with feelings of anxiety, at other times lost in admiration, has followed the *Vega's* adventurous and glorious voyage. The great work has been now accomplished—an entire people welcomes with unanimity and shouts of joy its heroes who have striven, and trusted, and conquered.

"'An entire people greets you, Baron Adolph Nordenskiöld, as foremost on that heroic roll—you who have long since been known to fame as an Arctic inquirer—you, the circumspect leader of those men by whom, after centuries of fruitless effort, the attempt to discover a North-East Passage has been brought to a successful issue.

"'At your side stands a member of the Swedish Navy, Captain Louis de Palander, the *Vega's* energetic, undaunted Commander. You are both of you surrounded by a stout-hearted host of explorers, your officers and crew, who, having shared your toils and dangers, come now to share the honours which you have won.

"'Chroniclers for all future time will preserve with feelings of veneration the account of the *Vega's* northern voyage, and at the same time bear testimony to what the manhood of Northmen can accomplish.

"'Our beloved Fatherland has won a new laurel wreath, to be laid on the altar of memory by the side of many that were won in days gone by. All honour to the men by whom that wreath has been won.

"'In the name of the Swedish people, and in my own name, I bring to you all a tribute of gratitude and admiration.'

"This royal speech was hailed with intense enthusiasm throughout Scandinavia, and the feeling which it created will, I can assure you, revive by what has been said and done this very morning."

Turning next to Mr. R. W. Giles, who was in attendance to receive the Medal on behalf of his kinsman, Mr. Ernest Giles, the PRESIDENT said:—

"The Council of the Royal Geographical Society are anxious, in distributing the Gold Medals of the year, to take into their consideration the geographical discoveries in different parts of the world, and they are especially anxious to give every due weight to the claims of explorers in the British Colonies. I have great pleasure in announcing that the 'Founder's Medal' will be awarded to Mr. Ernest Giles for having led four great expeditions through the interior of Western Australia in the years 1872–6, during which 6000 miles of route were surveyed, and 20,000 square miles of new country discovered. Mr. Ernest Giles has performed eminent service to geography in having led expeditions which have traversed the whole western interior of Australia; from Adelaide to Swan River, and from Champion Bay to the central line of electric telegraph. He has also carried out numerous minor but not less important explorations. The value of his services has been testified to by the Surveyor-General of Australia and by our successive Presidents in their annual addresses from 1873 to 1877. The interesting paper in which he described his journey from South to Western Australia in 1875, is published in the Journal of the Society for 1876.

"Mr. Ernest Giles is in Australia, but his relative, Mr. R. W. Giles, will receive the Medal on his behalf."

Mr. R. W. GILES said he very much desired that his kinsman could have been present, not only to receive the medal, but to have heard the kind words that had been expressed with regard to his labours. He would take care that his kinsman was informed of the interest with which his travels had been regarded by those who held the high position of chiefs of geographical science. This was not the first occasion on which the Royal Geographical Society had been pleased to mark their approbation of Mr. Ernest Giles's contributions to the geography of Australia, and this accentuation of their approval would be received by him with the utmost gratitude and satisfaction. If he were present, he would abstain from any words which might be regarded as egotistic or laudatory of his own work, but he would be most anxious that those who had contributed to his success should not be forgotten. He would first name Mr. E. Giles's firm and fast friend Baron von Müller, of Melbourne, who was the discoverer of the discoverer—the first to recognise in Mr. Giles the capacity which justified his being entrusted with the lives of men and the conduct of an important expedition. He not only recognised that, but he backed up his opinion by substantial support in order to enable Mr. Giles to commence his first very ill-equipped expedition. He also exerted himself greatly to promote the second expedition, which, though it met with a considerable amount of success, failed in the great object of crossing to the western coast. Those expeditions were conducted with horses, and he trusted that they would be the last that would be so conducted. It was well known that the *crux* of Australian exploration was contained in one word, water; and it could be easily understood how the necessity of providing a supply of water for a cavalcade of horses must add to the difficulties of an explorer. The only unhappy consequence that attended his horse expeditions was the loss of his poor companion Gibson, who perished in 1874, during the second expedition. Upon that occasion Mr. Giles exhibited an unselfish courage which had never been found wanting in any of the noble band of explorers. Unhappily, the sacrifice of himself which he appeared to make for the safety of his comrade failed, for Mr. Gibson, to whom he gave up his only horse, lost his way and his life. The later expeditions, which were in all respects successful, were conducted with camels. The first was of a minor character. Its objects were limited, and it had no general geographical importance, but at the same time it brought out into very strong contrast the qualities of horses and camels. One part of the expedition involved the traversing a tract of country 220 miles in width, absolutely devoid of water. Eight days were occupied in crossing it, during which the camels had not a drop of water. The horses that accompanied them were supplied with the store which the camels carried, but they all ultimately perished. The second Camel expedition succeeded in crossing the country from the telegraph line to Perth, on the western coast. They also made a return journey somewhat further to the north. The camels were supplied by the enterprise and sagacity of the Hon. Thomas Elder, of Australia, who was well known as the most distinguished promoter of Australian exploration. He was quite sure that his relative would scorn to take the praise which he had been able to acquire by means of these invaluable animals, without rendering his tribute of thanks to Mr. Elder for the services he had rendered in entirely altering the character of Australian exploration. He was unable to find words adequately to express his thanks for the honourable distinction which his relative had received, but it would be received with as much gratitude as it had been honestly earned.

Presentation of other Awards.

The President addressed Mr. R. N. Cust, who attended to receive the Presentation Watch which had been awarded to Bishop Crowther, of Western Africa; he said:—

"The Council of the Royal Geographical Society have unanimously voted a testimonial watch to Bishop Crowther, the native Missionary Bishop of Western Africa, in recognition of the services he has rendered for the past forty years to geographical science, by the assistance given to successive expeditions on the River Niger. He accompanied the expedition under Captain Trotter in 1841, and again in 1854. In 1857 he was a member of the exploring party under Dr. Baikie, and since then he has repeatedly ascended the Niger, besides traversing the neighbouring countries by land; and the descriptions he has given of the people and their languages, and the trade and products of the country, have greatly added to the sum of our geographical knowledge.

"Mr. Cust, I place this watch in your hands, as a friend and correspondent of Bishop Crowther, who is at present in Africa, preparing for another journey, with the request that you will forward it to him on the first convenient opportunity. I have the more pleasure in requesting you to undertake this duty, on account of the interest which you have taken in the very important subject of the organisation of a body of trained explorers to be selected from the educated natives of Africa."

Mr. CUST said he thanked the Society in the name of Bishop Crowther for the great honour conferred upon him. He would recall to the recollection of the members that Bishop Crowther was a released slave. There was still a great work to be done in Africa, and he trusted that some of those now present would live to see a negro explorer come in person to receive the gold medal of the Society for explorations properly done and scientifically reported.

The PRESIDENT then read the following resolution, which had been passed by the Council of the Society relative to Mr. E. H. Bunbury's recently published work 'A History of Ancient Geography':—

"The Council of the Royal Geographical Society desire to record their appreciation of Mr. E. H. Bunbury's literary labours in the production of 'A History of Ancient Geography,' a work of the highest value, combining accurate scholarship with large observation, and displaying a thorough acquaintance with modern geographical discovery, as well as with classical literature.

"It is unanimously resolved that a copy of this resolution be transmitted to Mr. Bunbury by the President, the Earl of Northbrook, with the best thanks of the Council for the service he has rendered to geographical science and culture."

Having read the resolution, the President placed a copy of it in the hands of Mr. Bunbury.* After which Major-General Sir H. C. RAWLINSON rose and said he was very glad of this opportunity of offering his testimony, such as it was, to the very great value of Mr. Bunbury's work. Its preparation must have involved an immense amount of reading and research, the results of which had been thoroughly utilised by its author. Perhaps the award of the Royal Geographical Society which was now granted to him did not possess the supreme and world-wide authority of a Degree of the French Academy, but it was at any rate a deliberate expression of the opinion of the best English geographers, who had been engaged all their lives in geographical studies. For his own part he could only say that if such a work had existed in his earlier days it would have saved him years of labour, and he could say the same on behalf of his brother, the translator of 'Herodotus.' He trusted that Mr. Bunbury's book, compendious and exhaustive as it was, would become a standard work of reference, and would find a place in the library of every geographer and scholar, and that ultimately it would become a text-book in the educational establishments of England.

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* Mr. Bunbury has since sent to the Council the following letter of acknowledgment:—

35, ST. JAMES' STREET, *June 2nd*, 1880.

"GENTLEMEN,—I beg to return you my best thanks for the honour you have done me by the resolution transmitted to me by your President, Lord Northbrook; a distinction for which I was certainly unprepared. While I deeply feel how far my work is from meriting the praises you have been so kind as to accord to it, or from attaining the standard to which I would fain have aspired, it is with a proud satisfaction that I find that the result of many years of conscientious labour has been such as to merit the approbation of so distinguished a body as the Council of the Geographical Society. Their approval is indeed a rich reward for all my labours. It is the more especially gratifying to me, that having been so many years a member of the Society—I was elected in 1839—during which I have been unable to contribute in any way to the progress of geographical knowledge, I should, before the close of my career, be found worthy of this public testimonial that I have been able to do something towards the advancement of that science which has been an object of interest to me from my earliest youth.

"I remain, Gentlemen,
"Your obedient servant,
"EDWARD H. BUNBURY.

"To the Council of the Royal Geographical Society."

PUBLIC SCHOOLS' PRIZE MEDALS.*

The medals had been awarded this year as follows by the Examiners, who were for PHYSICAL GEOGRAPHY, Commander V. L. Cameron, R.N., and for POLITICAL GEOGRAPHY, Admiral Sir Erasmus Ommanney, F.R.S.; the special subject for the year being "Western Africa, between the Sahara, the territory of Egypt, the Equatorial Lakes, and the sixth parallel of south latitude."

PHYSICAL GEOGRAPHY.—*Gold Medal*—David Bowie, Dulwich College. *Silver Medal* †—Albert Lewis Humphries, Liverpool College. *Honourably Mentioned*—Gustave Isidore Schorstein, City of London School; Sydney Edkins, City of London School; Philippe Joseph Hartog, University College School; Henderson McMaster, Liverpool College; Robert Galbraith Reid, Dulwich College.

POLITICAL GEOGRAPHY.—*Gold Medal*—Frederick James Naylor, Dulwich College. *Silver Medal*—Theodore Brooks, London International College. *Honourably Mentioned*—Charles Theodor Knaus, Dulwich College; Charles E. Mallet, Harrow School; William H. David Boyle, Eton College; Allan Danson Rigby, Liverpool College; Matthew George Grant, Liverpool College; Charles James Casher, Brighton College.

Mr. DOUGLAS FRESHFIELD said that, in the absence of Mr. F. Galton, the chairman of the Public Schools' Prizes Committee, it fell to him, as a Member of the Committee, to announce the result of the recent examinations. Before doing so he wished to make some remarks suggested by a tabular statement before him, showing the number of candidates who had submitted themselves for examination in each year, since the prizes were founded in 1869. Such a comparison showed rapid oscillation rather than any steady advance. In 1869 we began with 81 candidates, the number falling, in 1871, to 23. In 1876 the number rose again to 54, and this year stood at 32, which was somewhat below the average. This result must not, he thought, be looked on as discouraging. The large numbers at the commencement were doubtless due to ignorance of the nature of the examination, which was not confined to the old-fashioned school topography, a mere list of names to be learnt by rote, but aimed at testing the knowledge of boys in scientific geography. To prepare boys for the Society's examinations required considerable attainments in the teacher, and it is not every school, not even every public school, which is fortunate in the possession of adequate instructors. One of the results of the examinations would probably be to supply the first requisite of sound teaching—a number of competent teachers—under whom many schools might rival the successes won for Dulwich and Liverpool College under Dr. Carver and the Rev. George Butler. There was, he believed, no doubt that the importance of Geography as a branch of education was now generally recognised. Indirectly it fulfilled the first requisites of an educational subject, by inculcating at the same time accuracy in details and the habit of drawing from them broad conclusions. Whatever branch of science the student might follow up, he would find a knowledge of the conditions of the earth's surface, such as is supplied by physical geography, a staff in his hand. In the more prominent, but perhaps lower, walks of life such a knowledge was of great service. In the future those soldiers who best knew how to use their maps would win most battles, the merchants who best understood physical conditions would make most money, and the nation whose statesmen were scientific geographers would have the most scientific of all possible scientific frontiers. Turning to the detailed results of the last examination, he would point out that of the 52 schools which had been invited to compete 10 only had sent candidates. The examiners, in their Report to the Committee, speak very highly of the quality of the work done: Dulwich College had been most successful, securing both the gold medals, the Gold Medallist in Physical Geography having last year obtained the same position in Political Geography. Liverpool College was again successful, and the London International College had carried off a prize, and the City of London School had obtained a creditable position.

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* The Society's medals awarded to successful competitors in Geography at the Oxford and Cambridge Local Examinations have been, since our last report of results, as follows:—

OXFORD (June 1877).—*Silver Medal*—John Edward Lloyd, Chatham Institute, Liverpool. *Bronze Medal*—James Edwin Forty, City Middle-Class School.

CAMBRIDGE (December 1877).—*Silver Medal* (Physical Geography)—P. W. Evans, Cardiff. *Silver Medal* (Political Geography)—J. Haynes, West Buckland.

OXFORD (June 1878).—*Silver Medal*—Arthur Edwin Restarick, North London Collegiate School. *Bronze Medal*—Frederick William Kellett, Kingswood and Woodhouse Grove School.

CAMBRIDGE (December 1878).—*Silver Medal* (Physical Geography)—J. R. Davis, Banbury Centre. *Silver Medal* (Political Geography)—Miss Helen Jones, Notting Hill Centre.

OXFORD (June 1879).—*Silver Medal*—Allan Danson Rigby, Liverpool College. *Bronze Medal*—Ernest Edward Kellett, Kingswood School, Bath.

CAMBRIDGE (December 1879).—*Silver Medal* (Physical Geography)—Miss A. S. Westbury, Newcastle (Staffordshire) Centre. *Silver Medal* (Political Geography)—W. Hornsby, York Centre.

† The Silver Medal was awarded by the Examiner to Frank Taylor Sharpe, Liverpool College, but having already once gained that medal (1879), he was disqualified by the Rules from receiving it a second time.

Commander Cameron introduced the prize medallists in Physical Geography, and Admiral Sir Erasmus Ommanney those in Political Geography.

The President, in presenting the medals, said with regard to Dulwich College, which had carried off both the gold medals, he would by permission of the Meeting make one or two observations regarding that institution. Having had the honour two years ago of presenting the prizes to the boys at Dulwich College, and thus becoming acquainted with the head-master, Dr. Carver had written a letter to him containing some remarks on the study of geography in schools which he thought would be of interest to the Meeting. He enclosed a copy of the school list, and at the same time said:—"You will see from these lists that Bowie, the Gold Medallist in Physical Geography, obtained the prize of his form in 'Form Work,' and was bracketed for the prize in 'Greek and higher classics' with Naylor, the Gold Medallist in Political Geography. Your Lordship will, I am sure, regard these facts as not altogether immaterial. They show at any rate that the proficiency of these boys in geography has not been attained by any special 'cramming' or by the sacrifice of their general culture to one conspicuous but passing success. To me the success of the College in the competition of the Royal Geographical Society has been particularly gratifying, and just for this reason, because it has been obtained not by boys making 'modern' subjects their specialty, but by boys who were prepared to bring well-trained and cultivated minds to bear upon any subject to which their attention might be directed."

To David Bowie, the Gold Medallist in Physical Geography, the President said:—"I have great satisfaction in handing you this medal. A strong proof how well it is deserved is furnished by your having gained, as Mr. Freshfield has told us, last year the gold medal in the other branch of the science, Political Geography, and were honourably mentioned in the examination of the year previous." To the Silver Medallist, A. L. Humphries, the PRESIDENT said:—"This is the fifteenth medal gained by the school to which you belong, Liverpool College—a striking testimony to the skill and success with which geography is studied in that institution, and to the pains taken by its eminent head-master, the Rev. George Butler."

Mr. R. N. CUST, at the invitation of the President, announced the special subje[illegible] of next year's examination as being "Polynesia, including New Zealand."

The ballot for members of Council for 1880–81 then took place. The resu[illegible] was announced by Mr. Henriques, one of the scrutineers, who said that the lis[illegible] recommended by the present Council had been voted; a few dissentient votes onl[illegible] having been recorded. The list is as follows (the names of new Members, or thos[illegible] who change office, being in *italics*).

President: Right Hon. Lord Aberdare, F.R.S. *Vice-Presidents:* Sir Rutherford Alcock, K.C.B.; Major-General Sir H. C. Rawlinson, K.C.B.; Sir Henry Barkly, G.C.M.G., K.C.B.; *Sir Barrow H. Ellis*, K.C.S.I.; Captain F. J. O. Evans, R.N., C.B., F.R.S.; Francis Galton, Esq., F.R.S. *Treasurer:* Reginald T. Cocks, Esq. *Trustees:* Lord Houghton, D.C.L., F.R.S.; Sir John Lubbock, Bart., F.R.S. *Secretaries:* Clements R. Markham, Esq., C.B., F.R.S.; R. H. Major, Esq., F.S.A. *Foreign Secretary:* Lord Arthur Russell, M.P. *Members of Council: John Ball, Esq.*, F.R.S.; *Sir T. Fowell Buxton, Bart.;* Robert Needham Cust, Esq.; James Fergusson, Esq., F.R.S.; Sir T. Douglas Forsyth, K.C.S.I., C.B.; Douglas W. Freshfield, Esq.; Colonel H. H. Godwin-Austen; *J. K. Laughton, Esq.;* Lieut.-General Sir J. H. Lefroy, R.A., K.C.M.G., F.R.S.; Sir William L. Merewether, K.C.S.I., C.B.; *Admiral Sir Alexander Milne, Bart.*, G.C.B.; *Captain Sir G. S. Nares*, R.N., K.C.B.; Admiral Sir Erasmus Ommanney, C.B., F.R.S.; Colonel Sir Lewis Pelly, K.C.B., K.C.S.I.; *Lord Reay;* Major-General C. P. Rigby; S. W. Silver, Esq.; General R. Strachey, R.E., C.S.I., F.R.S.; *Sir Richard Temple, Bart.*, G.C.S.I.; Major-General Sir H. L. Thuillier, C.S.I., F.R.S.; Sir Harry C. Verney, Bart., M.P.

Sir RUTHERFORD ALCOCK proposed a vote of thanks to the President for having taken the chair on this occasion, and also for the very able and interesting address which he had delivered. It was full of points of great interest and originality. He was sorry to say that the Society had to take leave of his Lordship as their President. That was a sentiment which he was sure was generally shared in by all the Fellows, who must be perfectly aware how much they were indebted to anyone in Lord Northbrook's position, who left the duties of one of the highest offices of State to be present with them if only for an hour on the present occasion. It was a matter of great importance to the interests of geography generally, that men of the rank and position of Lord Northbrook should be seen to take an active interest not only in the Geographical Society generally, but to give hours of time and labour in attending to a great many administrative details, in order to maintain the prestige which the Society had already succeeded in securing, and to extend its usefulness. As a Member of the Council he (Sir R. Alcock) had constant opportunity of seeing how sedulously and anxiously Lord Northbrook attended to the administrative duties of the President. Of course they were very glad to know that they were to have such a successor as Lord Aberdare, but that did not diminish their regret in losing the services of Lord Northbrook.

Admiral Sir G. H. RICHARDS seconded the resolution, which was unanimously adopted.

A vote of thanks was proposed by Mr. J. K. LAUGHTON to the retiring Members of Council, the Committees, the Auditors, and the Scrutineers. It was seconded by Admiral NOLLOTH, and unanimously agreed to.

THE ANNIVERSARY DINNER.

The customary annual dinner of Fellows and their friends took place at half-past seven, on the evening of the same day, at Willis's Rooms, St. James's; Rear-Admiral His Royal Highness the DUKE of EDINBURGH, K.G., Honorary President, in the chair. About 200 Fellows and their friends attended.

Among the distinguished guests and members present were:—H.E. Prince Lobanof, Russian Ambassador; H.E. Count Piper, Swedish Minister; Right Hon. Lord Aberdare, President Elect; Right Hon. the Earl of Northbrook, G.C.S.I.; Lord Houghton; Lord Cottesloe; Major-General Sir Henry C. Rawlinson, K.C.B.; General Sir Samuel Browne, K.C.B.; Lieutenant-General Sir Henry Thuillier, C.S.I.; General Beauchamp Walker, C.B.; General Sir Arthur Phayre, G.C.M.G.; General Dillon; General Sir Henry Norman, K.C.B.; General C. P. Rigby; Admiral Sir Alexander Milne, Bart., G.C.B.; Admiral Sir E. Ommanney, C.B.; Admiral D. Miller; Admiral A. H. Hoskins; Sir Richard Temple, Bart., G.C.S.I.; Sir Rutherford Alcock, K.C.B.; Sir Henry Barkly, G.C.M.G.; Sir Barrow Ellis, K.C.S.I.; Sir George Nares, K.C.B.; Colonel Sir Lewis Pelly, K.C.B.; Sir Brooke Robertson, C.B.; Colonel J. A. Grant, C.S.I.; Colonel E. B. Sladen; Colonel H. H. Godwin-Austen; Colonel E. C. Sim; Captain F. J. Evans, R.N., C.B.; Captain FitzRoy, R.N.; Captain W. J. Gill; Commander V. L. Cameron, R.N., C.B.; W. A. Tyssen Amherst, Esq., M.P.; G. Errington, Esq., M.P.; Andrew Cassels, Esq.; Lawrence Oliphant, Esq.; &c.

The toasts were:—Her Majesty the Queen, Patron of the Royal Geographical Society, proposed by the Chairman; the Prince of Wales and the Royal Family, by the Earl of Northbrook, responded to by H.R.H. the Duke of Edinburgh; the Army and Navy, proposed by the Chairman, responded to by Admiral Sir Alexander Milne, Bart., and General Beauchamp Walker; the Medallists, proposed by the Earl of Northbrook, and responded to by H.E. Count Piper, the Swedish Minister. In proposing the toast, Lord Northbrook dwelt upon the recent completion of the North-East Passage by the Swedish Expedition under Professor Nordenskiöld and the Society's Royal Medallist, Lieutenant Palander, and alluded to the attempts of the English three centuries ago in the same direction. It was in an effort to solve the same problem that Sir Hugh Willoughby, in the reign of Edward VI., lost his life and the lives of all his crew. What had been attempted in vain by many nations had been at length achieved by Sweden. His Lordship also alluded to the extensive journeys of exploration in the western interior of Australia, performed by the second medallist, Mr. Ernest Giles. The next toast—the retiring President—was proposed by Major-General Sir H. C. Rawlinson, who said there was no scientific Society more dependent than theirs for its success on the control, guidance, and encouragement of its Presidents; they might remember how some thirty years ago they were in a very crippled state, diminishing in numbers, and with a declining revenue, and without public sympathy or support; at the period of greatest depression Sir Roderick Murchison took the reins of government, and mainly by his influence they were relieved from their difficulties and launched on the way to prosperity: the Society had now nearly 3400 Fellows; it had 40,000*l.* of invested property, an annual income of between 8000*l.* and 9000*l.*, and a most valuable collection of books and maps: they had also increased their usefulness and influence, and they might take the credit of having induced the late Government to send the recent expedition under Captain Nares towards the North Pole: they had also done much towards the opening-up of Africa, and they gave substantial support and encouragement to travellers in all parts of the world. Lord Northbrook briefly replied. Sir Rutherford Alcock then proposed the sixth toast—the incoming President, Lord ABERDARE—who, after acknowledging the compliment, proposed the seventh and concluding toast—the health of His Royal Highness, the Chairman. His Lordship said that no one could have been better chosen to fill the office of Honorary President of the Geographical Society; His Royal Highness had carried the British flag to all quarters of the globe, and had just returned from helping suffering humanity in the west of Ireland. His Royal Highness, in responding to the toast, gave an account of the present state of the suffering population on the west coast of Ireland. The assembly shortly afterwards dispersed.

REPORT OF THE EVENING MEETINGS, SESSION 1879-8

Fourteenth Meeting, 14*th June*, 1880.—The Right Hon. Lord ABERDARE, F.R. President, in the Chair.

ELECTIONS.—*G. P. V. Aylmer, Esq.; Lieut. George W. Bartram*, R.E.; *Char Dalton, Esq.; Robert W. Felkin, Esq.; H. R. Graham, Esq.; Edward Jenkinso Esq.; Walter Evans Jones, Esq.; Sir Benjamin Pine*, K.C.M.G.; *The Hon. Franc Plunket; Sir James Ramsden; Thomas Henry Thornton, Esq.; David Williams, Esq.; Lieut.-General Sir Garnet J. Wolseley*, G.C.M.G., K.C.B.; *Rev. Chas. Thos. Wilson.*

On taking the Chair, Lord Aberdare in a few words expressed his thanks for the honour conferred upon him by the Society in electing him their President for the year 1880–81; he then introduced to the Meeting Sir Richard Temple, who delivered a lecture, illustrated by wall-maps and pictorial illustrations, on

"The Highway from the Indus to Candahar."

The lecture, illustrated by maps and diagram, and the discussion which followed, will appear in a subsequent number of the 'Proceedings.'

PROCEEDINGS OF FOREIGN SOCIETIES.

Geographical Society of Paris.—June 4th, 1880: M. A. GRANDIDIER in the Chair.—Communications were read from the Secretary of the Society of Commercial Geography of Bordeaux, announcing the formation at Rochelle of a section of the Bordeaux Society, and from Dr. Montano, from Davao, in Mindanao, April 10th, 1880, giving an account of the Boulé-Doupis race which he had discovered, and which is now nearly extinct.—A letter was also read from M. Bran de St. Pol Lias, dated from Pantch-Pérak (Point d'Atjeh), Sumatra, giving details of the assassination of M. Wallon, a French traveller, and his companion, and stating that the Dutch authorities had despatched a military expedition to punish the perpetrators of the deed.—A paper was then read on the successive removals of the ashes of Christopher Columbus, by M. Germond de Lavigne. The great navigator died in 1505, at Valladolid, and his body remained for four years buried at the Franciscan Convent in that city. Afterwards, at the request of the family, it was transferred to the Cartuja of Seville, where it reposed twenty-three years. At the request of the son of Columbus the remains were then transferred to St. Domingo; they arrived there safely, and whilst the cathedral was being completed they were deposited in some unknown resting-place. In 1540, as soon as the monument was finished, they were placed in a special niche in the cathedral, and there they remained until the occurrence of an earthquake, which damaged the edifice. They were then exhumed, and on the leaden coffin which contained them being opened, nothing was found but the débris and a fore-arm a little better preserved; the whole was then replaced in another part of the church. On the island of St. Domingo falling into the power of the French the remains were again disinterred, and the result of the procès-verbal drawn up after the examination on that occasion was, that the body of the great discoverer was then reduced to a small quantity of ashes, not more than would fill a plate. Nevertheless, the precious dust was conveyed to Havana, and deposited in a chapel of the General Hospital, whence they were afterwards conveyed to the cemetery, where they finally disappeared. A pretended discovery of the remains of Christopher Columbus at St. Domingo has recently been talked about; but a careful inquiry into the subject has shown that it was impossible this could be the case, as a pistol bullet was found among the well-preserved bones in the coffin. The body, in fact, was that of some unknown relative of Columbus, and the whole affair was the result of a fraud concocted by Bishop Coccia, of St. Domingo, a prelate of Italian origin, who was desirous of reviving the glory of his illustrious compatriot, and thus bringing profit to his diocese. It is singular that when the Marquis of Tavvia built the so-called House of Pilate, at Seville, on the plan of Pilate's house at Jerusalem, he found at Rome an urn containing the ashes of the Emperor Trajan, who was born at Seville, and in depositing this in his new house the ashes were capsized by accident, and thus returned to their native earth. This destiny resembles in some measure that of Christopher Columbus.—M. Soleillet then gave some account of his recent journey in the Adraar country, near Senegal. The commerce of the country consists of dates, gold, ostrich feathers, and horses from Morocco. The last-mentioned fact proves that from Morocco to St. Louis de Senegal, by the Ued Nun, there must be always water and pasture. Salt, found in a *sebka* belonging to Ely, King of the Trarzas, in slabs of about 10 inches thick, separated by thin layers of clay, is a valuable object of exchange. The organisation of the Moorish tribes is absolutely identical with the feudal arrangement; there is a class of warrior nobles, and a class of vassals. The chief receives the taxes, and alone has the right to wear white trousers, the distinctive mark of his power. Amongst the natural products of the country is a vegetable sap, from which, according to M. Thenard, the chemist, a very siccative oil can be easily extracted, and also a resin, in the proportion of 36 per cent., which has all the characters of indiarubber.

Geographical Society of Cairo.—May 14th, 1880.—M. Bonola, the Secretary-General, delivered an address on Arctic Voyages, and more particularly the recent Swedish expedition under Professor Nordenskiöld. He also exhibited a map of the Arctic regions on a large scale.—In referring to the paper that Colonel Purdy was about to read, General Stone pointed out, as he had done on previous occasions, that although wars were sometimes productive of evil consequences, they nevertheless yielded some useful results to science. In this way it was that Darfur, which but a few years ago was one of the least known regions of Africa, was attracting interest by the fact of its having been surveyed. General Stone next sketched the history of the conquest of this large province, and of the part which Ismail Eyub Pasha had taken in it, remarking that in consequence thereof the American officers in the service of the Khedive, and chiefly Colonel Purdy, had been able to lay down the map of Darfur.—On the proposition of General Stone, on behalf of the Committee of the Society, Ismail Eyub Pasha was unanimously elected an honorary member of the Society.—Colonel Purdy afterwards exhibited his large map of Darfur, and gave some account of his journey to Dara and Hofra-el-Nahas. Colonel Purdy's paper, which treats of the inhabitants and resources of Darfur, its fauna and flora, hydrography, &c., will be published in the 'Bulletin' of the Society.

NEW BOOKS.

(By E. C. Rye, *Librarian* R.G.S.)

EUROPE.

Berlioux, E.-F.—Lecture de la Carte de France. Le Jura. Paris (Dumaine): 1880, 8vo., pp. 140, maps.

This study of the region of the Jura mountains, professedly on the principles of scientific geography, has been selected in consequence of the importance of its subject in connection with the defence of the French frontier. It is preceded by a short introduction on the general character of the Rhone basin, and is illustrated by an autographed map, taken from the publications of the French État-Major and the Swiss and German official maps, and another showing [illegible] general formation of the range. Frequent reference is made to matters of international policy; otherwise, the work contains a lucid exposition of the physical geography of the interesting isolated chain of the Jura.

Crawfurd, O.—Portugal, Old and New. London (C. Kegan Paul & Co.): 1880, 8vo., pp. 386, maps, illustrations. Price 16*s.*

The author, H.B.M. Consul at Oporto, is already known as a writer on the country under the pseudonym of "Latouche"; and his present work has already appeared in part in various London magazines. It has no pretensions to exhausting any branch of the subjects discussed in it, combining historical matter with the domestic economy of the present day (including a lengthy chapter on port wine), accounts of the lost city of Citania and its supposed site, of Setubal and the ruins of Troia (with sketch-map, scale 6½ miles to the inch), of the Portuguese colony at Madeira, &c. The few illustrations are good; and a large map of Portugal (26 miles to the inch) is given.

Greene, F. V.—The Russian Army and its Campaigns in Turkey in 1877–1878. London (W. H. Allen & Co.): 1880, large 8vo., pp. 459, and Atlas of 22 maps and 4 pls. Price 1*l.* 12*s.*

The author, a First Lieutenant in the Corps of Engineers, U.S. Army, was Military Attaché to the U.S. Legation at St. Petersburg. He was personally a witness of the chief events of the Russo-Turkish war, which he describes from his own experiences and official and other trustworthy reports. This work is mentioned here on account of the excellent maps, which comprise a general view of the military circumscriptions of the Russian Empire, the theatre of the war in Europe (scale 1:4,500,000) and in Asia (same scale), progress maps during three periods of the campaign, special maps of Galatz and Sistova, and various coloured maps giving much topographical detail of the localities of the chief battles.

Séguin, L. G.—The Black Forest, its People and Legends. London (Strahan): [1880] sm. 8vo., pp. 428, maps, woodcuts. Price 12*s.*

Intended for the use of tourists, but with scarcely sufficient practical information.

ASIA.

Cordier, Henri.—Bibliotheca Sinica. Dictionnaire Bibliographique des Ouvrages relatifs à l'Empire Chinois. Tome premier. 3^{me} fascicule. Paris (Leroux): 1879 [1880], large 8vo., double col., pp. 449–640. (*Trübner: price of the whole work, 50 frcs.*)

The present part completes the references to publications bearing on Religion (including medical reports of mission hospitals, plans of cemeteries, &c.), and commences those referring to Science and Art.

Guérin, V.—Description Géographique, Historique et Archéologique de La Palestine, accompagnée de Cartes détaillées. Troisième partie. Galilée. Tome II. Paris (Leroux): 1880, large 8vo., pp. 563. (*Williams & Norgate:* price of Pt. 3, 1*l.*)

The first vol. of this section was noticed in the present vol. of 'Proceedings,' p. 139. This concluding portion gives topographical and archæological details of the localities actually seen by the author, including prolix particulars as to the exact hour and minute of the time of each visit, the whole explorations having been apparently made between May 19, 1875, when he landed at Smyrna, and December 11 of the same year, when he re-embarked at Beyrut. The absence of any introductory or concluding summary as to the plan or results of the undertaking chronicled in these volumes makes them difficult of appreciation; especially as the chapter headings consist of mere strings of Arabic names. The only index is a list of the ancient and modern geographical names mentioned.

Macnamara, F. N.—Climate and Medical Topography in their relation to the Disease-Distribution of the Himalayan and Sub-Himalayan Districts of British India, &c. London (Longmans, Green, & Co.): 1880, 8vo., pp. 542, map. Price 1*l.* 1*s.*

Although purely professional in its object (especially as regards a discussion as to the malarious origin of goitre and some other diseases), this work is of general and local interest, containing as it does descriptive accounts of the physical geography of Northern India, with observations on the geology, climate, elevation, water system, &c., of many separate districts. The map (scale nearly 80 miles to the inch) includes the whole of Northern India, and there is a good index.

AFRICA.

Rivoyre, Denis de.—Mer Rouge et Abyssinie. Paris (Plon): 1880, 16mo., pp. 308. (*Dulau:* price 3*s.*)

The author, who avoids dates, appears to have gone by steamer from Suez to Yembo and Jiddah, then crossing to Massowah, whence he travelled into the interior, to Hebo and Halai. Returning to the coast, he finally visited Obock, the small French possession on the Gulf of Aden, acquired in 1862; though not hitherto utilised, the author considers this to be the future French "Singapore of Africa."

AMERICA.

Acosta, Joseph de.—The Natural & Moral History of the Indies, by Father Joseph de Acosta. Reprinted from the English translated Edition of Edward Grimston, 1604, and edited, with Notes and an Introduction, by Clements R. Markham, C.B., F.R.S. Vol. I. The Natural History (Books i., ii., iii., and iv.). London: printed for the Hakluyt Society (Richards, 37, Great Queen Street, W.C.), 1880: 8vo., pp. xlv. and 295. Issued with this work is also a "Map of Peru; to illustrate the Travels of Cieza de Leon, in 1532–50; the Royal Commentaries of Garcilasso De la Vega (1609); and the Natural and Moral History of the Indies, by Father Joseph de Acosta (1608)."

Forms No. LX. of the Hakluyt Society's publications, and is to be completed in another consecutively paged volume. The identification of the English translation is the chief point in the introduction. The map is that of the Empire of the Yncas by Trelawny Saunders, from vol. xlii. of the R. G. S. Journal.

Fleming, Sandford.—Report and Documents in reference to the Canadian Pacific Railway. 1880. Ottawa (Maclean, Roger, & Co.): 1880, 8vo., pp. 373, maps, plans, and profiles.

Former explorations have proved that the Yellow Head Pass offers the most advantages for the passage by rail of the Rocky Mountains, and that two routes are available for that purpose from Tête Jaune Cache, 50 miles west of it; of these, the first (to a point near Fort George and then with four subsidiary lines, of which that by Bute Inlet was most supported) was not considered by the engineers so practicable as the second, which follows the Thompson and Fraser rivers to Burrard Inlet. This, however, was marked by many difficulties, and involved a very large outlay, being, moreover, not received with general satisfaction in British Columbia; further explorations were therefore instituted in the more northerly districts of the colony, with the object of ascertaining the capabilities of the Peace and Skeena rivers, and of Port Simpson. These explorations are detailed in various Reports by Messrs. Cambie, MacLeod, Keefer, Horetzky, and Gordon, given as Appendices; and result in the establishment of Port Simpson as a good harbour, and in the practicability of at least three different railway routes from Hazelton at the Forks, which are respectively illustrated by a map and profiles. The information obtained did not, however, apparently satisfy the Government as to the superiority of the northern routes; and that by the Yellow Head Pass and Burrard Inlet was definitely adopted, Mr. Fleming being directed to place 125 miles of the most difficult portion under contract at once. As regards the absolute condition of the Canadian Pacific Railway as a whole, it may be here noted that the rails are laid for 136 miles west of Fort William, and 90 miles east of Selkirk (a space of some 160 miles intervening between these points), and that the Pembina branch, Selkirk to Emerson on the Boundary line, 85 miles, is not only laid but in working order, as also is part of the line from Selkirk eastwards to Cross Lake. Including this working portion, 722 miles are now under contract for construction. These figures are given here, on account of the maps of the Surveys not affording an appreciable idea of the actual condition of the operations.

It is, however, in the accounts of the explorations of the Peace River region and of the northern parts of British Columbia that the greatest interest of this Report centres. A plateau, generally 2000 feet high, was found to be fertile, a large portion of the prairie land being immediately available from an agricultural point of view; but it is not established beyond question that the systematic growth of the higher cereals is possible in it; indeed the injury done by severe frosts in the latter part of August to growing crops round some of the Hudson Bay Company's Forts, would, unless the climate of 1879 were exceptional, almost prove the contrary. Dr. Dawson gives a special report on the climate and agricultural value, general geological features, and minerals of economic importance of this little-known region; Mr. Hunter one on the agricultural capabilities of Vancouver Island; and Captain Brundige another on the harbours and northern coast of British Columbia. The Rev. Mr. Tomlinson contributes meteorological observations, with barometer and thermometer readings at the Forks of the Skeena; and a compiled account of the physical character of the Prairie region by Mr. Ridout, and Mr. Macoun's remarks on the land, wood, and water of the north-west territories from the 102nd to 115th meridian, and between the 51st and 53rd parallels, will be found of especial interest. The remaining portions of the Report are professional.

In addition to the maps above mentioned, and some professional diagrams, this Report contains a longitudinal section of the Red River from the City to the Lake of Winnipeg, showing the submerged district during floods; and two maps of the Prairie region distinguishing the general physical character of the country on the routes followed by different explorers and scientific travellers, and also indicating the limits within which good land is known to exist between Manitoba and the Rocky Mountains.

Hayden, F. V.—Eleventh Annual Report of the United States Geological and Geographical Survey of the Territories, embracing Idaho and Wyoming, being a Report of Progress of the Exploration for the year 1877. Washington (Government Printing Office): 1879, 8vo., pp. 720, maps, pls., and sections.

On the completion of the work in Colorado, in 1876, it was continued into Idaho and Wyoming Territories, northward and westward of the northern boundary of Clarence King's survey of the Fortieth parallel. After a preliminary triangulation, covering an area of 28,000 square miles, extending from long. 107° to 112°, and between N. lat. 41° 10′ and 43° 50′, topographical field work was carried on by three separate parties:—(1) under Mr. G. R. Bechler, in the country about the sources of the Snake river, including the very rugged Téton range and the northern half of the Wind River mountains. After surveying 6000 square miles, the proximity of hostile Indians prevented further operations; but the district south of the Snake river was found to consist of fine grazing land, with large areas of arable in the valleys of the Blackfoot and Caribou ranges: north of that river, the mass of the country was heavily timbered and mountainous. (2) Under Mr. H. Gannett, in a district immediately south of the preceding, and including the northern half of the Green River basin, nearly all the drainage area of the Bear river, and of several branches of the Snake river, comprising a portion also of Utah. The Green River basin itself is a broad, flat expanse of grass and sage-brush, with fertile and easily irrigated valleys, abounding in water, and the higher ranges are well timbered. (3) Under Mr. G. B. Chittenden, in an area east of the Green River basin, including the valleys of the Wind river and the Sweetwater, with the Sweetwater mountains and their southern desert-like plateaus. Of this, nearly 11,000 square miles were surveyed, nearly all being mountain or desert.

The total area surveyed was about 29,000 square miles, and makes a very considerable addition to the knowledge of Western America. The economic value of the land has been carefully noted, especially as regards capability of irrigation. Of the results in geology, the primary object of the survey, it may be observed here that remains of enormous ancient glaciers were discovered on the western side of the Wind River mountains, and mud-springs, analogous to those of the Geyser region, were found and examined, between the Seminoe hills and Rawlings; large collections of basins of old springs formed of calcareous *tufa* were also examined on the Bear river in Idaho, near Morristown. Of the allied sciences usually included in American reports of this nature, Sir Joseph Hooker's outline of the Rocky Mountain flora, based on his personal experiences in company with Dr. Asa Gray, is of especial interest; as also are the accounts of the Moqui towns in cliffs and caves.

The Itineraries given at the heads of the divisions of the Report contain much topographical detail. In the Sweetwater section (of which the account is given by Mr. F. M. Endlich), between Wash-a-kie Station and Camp Stambaugh, an alkaline lake (Trail Lake) was found which, instead of being, as anticipated, situated on a divide between the Atlantic and Pacific waters, was on a large tract of neutral ground, the creeks and streams emptying into "sinks," which were mostly perfectly dry. The mud-springs above mentioned, between Rawlings and Whiskey Gap, were very peculiar, consisting of hundreds of bee-hive shaped mounds, from 2 to 15 feet high, covering an area of a mile long by half a mile wide, and having at the top circular openings filled with ice-cold water. Scattered in profusion over the intervening ground were the bleached bones of buffalo, wapiti, coyotes, and other animals which, attracted by the temptation of water in a very arid country, had fallen victims to the treacherous soil, a superficial layer of sandy mud forming an engulfing quicksand. The water in this district had evidently also caused it to be largely frequented by Indians, as innumerable flakes of flint, chalcedony, &c., were found, the remains of an old arrow-head manufactory. The general topography of this part of South Central Wyoming, the Sweetwater hills, plateau, and drainage area, and the drainage areas of the Wind and Green rivers, with the lakes, springs, means of communication, Indians, vegetation, and game, are ably discussed by Mr. Endlich in this introductory portion; the purely geological part concluding with a notice of the economic mineral products, especially referring to gold.

Mr. O. St. John, who describes the results of the survey of the Téton division, gives an outline of its general surface features, well illustrated by a drainage sketch map (scale 10 miles to the inch), and many outline plates, which, though intended to depict geological subjects, have an equal geographical importance. This section comprises the continental watershed, near Togwotee Pass (9621 feet), in the Buffalo Fork Range, a region of forbidding grandeur, with volcanic crests rising above timber line, and dull bands of volcanic ledges almost destitute of vegetation on their precipitous sides.

The general description of the Green River division, by Dr. A. C. Peale, covering an area of 13,000 square miles, contains much topographical detail, and is illustrated by some extensive panoramic sketches of the Green River basin and Wind River mountains, with maps of the western side of the former, and of the Blackfoot basin and Bear Lake, also by some excellent views of the wonderful basaltic beds in the lower Portneuf valley, and of the calcareous tufa springs above mentioned (shown also on a special map of the Soda Springs region). The remaining numerous illustrations are purely geological.

The Report concludes with Mr. A. D. Wilson's account and map of the primary triangulation (with lists of azimuths and distances), and with a special geographical paper by Mr. H. Gannett, fixing positions and elevations, and describing the physical features of the great region surveyed, and its economic products and capabilities.

Hayden, F. V.—The Great West: its Attractions and Resources, containin popular description of the marvellous scenery, physical geography, fossils, glaciers of this wonderful region; and the recent explorations in the Yellowst Park, "The Wonderland of America." Philadelphia (Franklin Publishing Co.) Bloomington (Brodix): 1880, 8vo., pp. 87, illustrations.

AUSTRALASIA.

Bathgate, John.—New Zealand: Its Resources and Prospects. London an Edinburgh (W. & R. Chambers): 1880, sm. 8vo., pp. 121, maps, illustration Price 1*s.* 6*d.*

A general description, apparently intended for emigrants. The author is District Judge of Dunedin.

Crawford, J. C.—Recollections of Travel in New Zealand and Australia. Londo (Trübner): 1880, 8vo., pp. 468, maps, woodcuts. Price 18*s.*

The author was present when the first settlers arrived in New Zealand, and records his early experiences of travel and life in the colony in its wild state. The maps are (1) to illustrate his different journeys; (2) geological; and (3) physiographical. Two chapters are devoted to a sketch of the geology and physical geography as bearing on the development of economic industries. The illustrations appear to be original; and the work will be found of interest for historical purposes.

Rivière, Henri.—Souvenirs de la Nouvelle-Calédonie. Paris (Lévy): 1880, 12mo., pp. 296. (*Dulau:* price 3*s.*)

This volume of the "Bibliothèque Contemporaine" contains a general geographical and historical sketch of New Caledonia, followed by an account of the author's personal experiences from July 1876 to April 1879, chiefly bearing upon the insurrection against French authority.

GENERAL.

Clarke, Colonel A. R.—Geodesy. Oxford (Clarendon Press): 1880, 8vo., pp. 356. (London: Macmillan, price 12*s.* 6*d.*)

This issue of the Clarendon Press Series is apparently the only treatise on geodetic surveys in the English language, except Airy's article "Figure of the Earth" in the 'Encyclopædia Metropolitana.' Many valuable works of local application have however been published recently, and their results have been utilised by the author, who adopts (about) 292 : 293 as the ratio of the earth's axes, thus avoiding the hiatus hitherto existing between the ratios deduced from pendulum observations and from meridian measurements. An introductory history of geodetical operations is given, from the time of Snellius, and the different theories of the earth's figure are reviewed; but the bulk of the book is purely trigonometrical and mathematical.

Leyland, R. W.—Round the World in 124 Days. Liverpool (Walmsley) and London (Hamilton and Adams): 1880, 8vo., pp. 323, map, photogrs.

A necessarily hurried sketch of a holiday tour round the world, viâ Suez, Bombay, Singapore, Shanghai, Yokohama, San Francisco, and Montreal, shown on a circumpolar map. Some autotyped views in Japan, &c., are good.

NEW MAPS.

(By J. Coles, *Map Curator* R.G.S.)

WORLD.

Friederichsen, L., & Co.—1. Weltkarte in Merkator's Projektion zur Veranschaulichung der Linien gleicher magnetischer Variation (Deklination), 1880.

2. Linien gleicher magnetischer Inklination, 1880.

3. Linien gleicher magnetischer Horizontal-Intensität nach Gauss'schen Einheiten, 1880.

Herausgegeben von der Deutschen Seewarte, Abth. II. L. Friederichsen & Co., Hamburg. 3 maps. Price 3*s*. (*Dulau.*)

ARCTIC REGIONS.

Holmboe, O.—Oversigtskart over Nordpolarlandene efter de nyeste Kilder tilligemed Vegas Kurs fra Jenisei til Östkap, 1878–79, udarbeidet af O. Holmboe. Scale 1 : 8,000,000 or 109·5 geographical miles to an inch. Christiania, 1880.

This map, which is on Mercator's projection, exhibits the tracks of all the principal eastern Arctic voyages since that of William Barents. The chief feature of interest is the track of Professor Nordenskiöld in the *Vega* from Jugor Straits, round Cape Tshjeluskin to her winter quarters near Sardre Kamen, about one hundred and thirty miles from East Cape (Bhering Straits). The map is published at Christiania, and can be procured through Dulau & Co.

EUROPE.

Arendts, C.—Specialkarte d. Königr. Bayern in seiner Gerichts- u. Verwaltungs-Eintheilung. Scale 1 : 400,000 or 5·5 geographical miles to an inch. 4 sheets, coloured. C. Arendts, Stuttgart. Price 6*s*. (*Dulau.*)

Austrian Military Geographical Institute.—Karte d. Salzkammergutes u. der angrenzenden Gebiete zwischen Salzach u. Enns. Vom k.-k. militär-geograf. Institute zusammengestellt. Scale 1 : 100,000 or 1·3 geographical mile to an inch. Wien. 2 sheets. Price 4*s*. (*Dulau.*)

De Gubernatis, E.—Carta d' Epiro, compilato dietro gli studii fatti negli anni 1869–75. Scale 1 : 400,000 or 5·5 geographical miles to an inch. Cromolitografia. Roma, 1880. Price 6*s*. (*Dulau.*)

Drioux et Leroy.—Carte politique et physique de la Suisse. E. Belin, Paris. (*Dulau.*)

Hartleben.—Karte der Donau von ihrem Ursprunge bis an die Mundüng. 16 sections on 9 sheets. Scale 1 : 300,000 or 4·1 geographical miles to an inch. Hartleben, Vienna. Price 4*s*. (*Dulau.*)

Michel's, C.—Alpenkarte. Scale 1 : 400,000 or 5·5 geographical miles to an inch. Sect. 3, Boden-See; 4, Hohenschwangau; 9, Rhein-Thal; 15, Como-See. C. Michel's, München. Coloured. Price 1*s*. each. (*Dulau.*)

Petermann's 'Geographische Mittheilungen.'—Die Waldungen des Bayerischen Spessart. Von Oberförster Dr. R. Weber. Scale 1 : 200,000 or 2·7 geographical miles to an inch. Petermann's 'Geographische Mittheilungen,' Jahrgang 1880, Tafel 10. Justus Perthes, Gotha. (*Dulau.*)

Reisinger, F.—Karte der Umgebung v. Komotau, Brüx, Bilin, Teplitz, Aussig, Leitmeritz u. Theresienstadt. Scale 1 : 150,000 or 2 geographical miles to an inch. Brüx. Coloured. Price 1*s*. 6*d*. (*Dulau.*)

Scheda, Josef Ritter von, k.-k. Generalmajor i. P. — General-Karte der Balkan-Länder enthaltend: die Fürstenthümer Rumänien, Serbien und Montenegro, Bosnien und die Herzegovina, Bulgarien und Ost-Rumelien, die türkischen Provinzen in Europa, nebst dem Plane von Constantinopel, und das ganze Königreich Griechenland. 13 Blätter. Scale 1 : 864,000 or 11·8 geographical miles to an inch. Von A. Steinhauser, nach den neuesten officiellen Materialien gänzlich umgearbeitete, Ausgabe von 1880. Artaria & Co., Vienna. Price 18s. (*Dulau.*)

This is a new edition of Scheda's Balkan-Länder, giving all corrections up to date.

Winter.—Topographische Karte von Osnabrück und Umgegend. Kreis Osnabrück, Melle und angrenz. Landestheile. Scale 1 : 120,000 or 1·6 geographical mile to an inch. Winter, Osnabrück. Coloured. Price 2*s.* 6*d.* (*Dulau.*)

GEOLOGICAL SURVEY MAPS.

6-inch Scale:—Yorkshire, No. 32, 6*s.* (*Stanford, Agent.*)

AFRICA.

Levasseur, E.—Carte de l'Algérie, 2 feuilles. Delagrave, Paris. (*Dulau.*)

AMERICA.

Nell, Louis, C.E.—Topographical and Township Map of part of the State of Colorado, exhibiting the San Juan, Gunnison and California Mining Regions. Compiled from U.S. Government Surveys and other authentic sources by Louis Nell, Civil Engineer. Scale 1 : 570,240 or 7·8 geographical miles to an inch. Washington, D.C., 1880.

This is an advance sheet of a map of the whole State of Colorado, to be published some time during the present year.

——, White River Indian Reservation, Colorado. Scale 1 : 570,240 or 7·8 geographical miles to an inch. Washington, D.C., 1880.

This sheet is published as supplement to Nell's Map of Central and South-western Colorado, to represent the whole area of the Ute Indian Reservations.

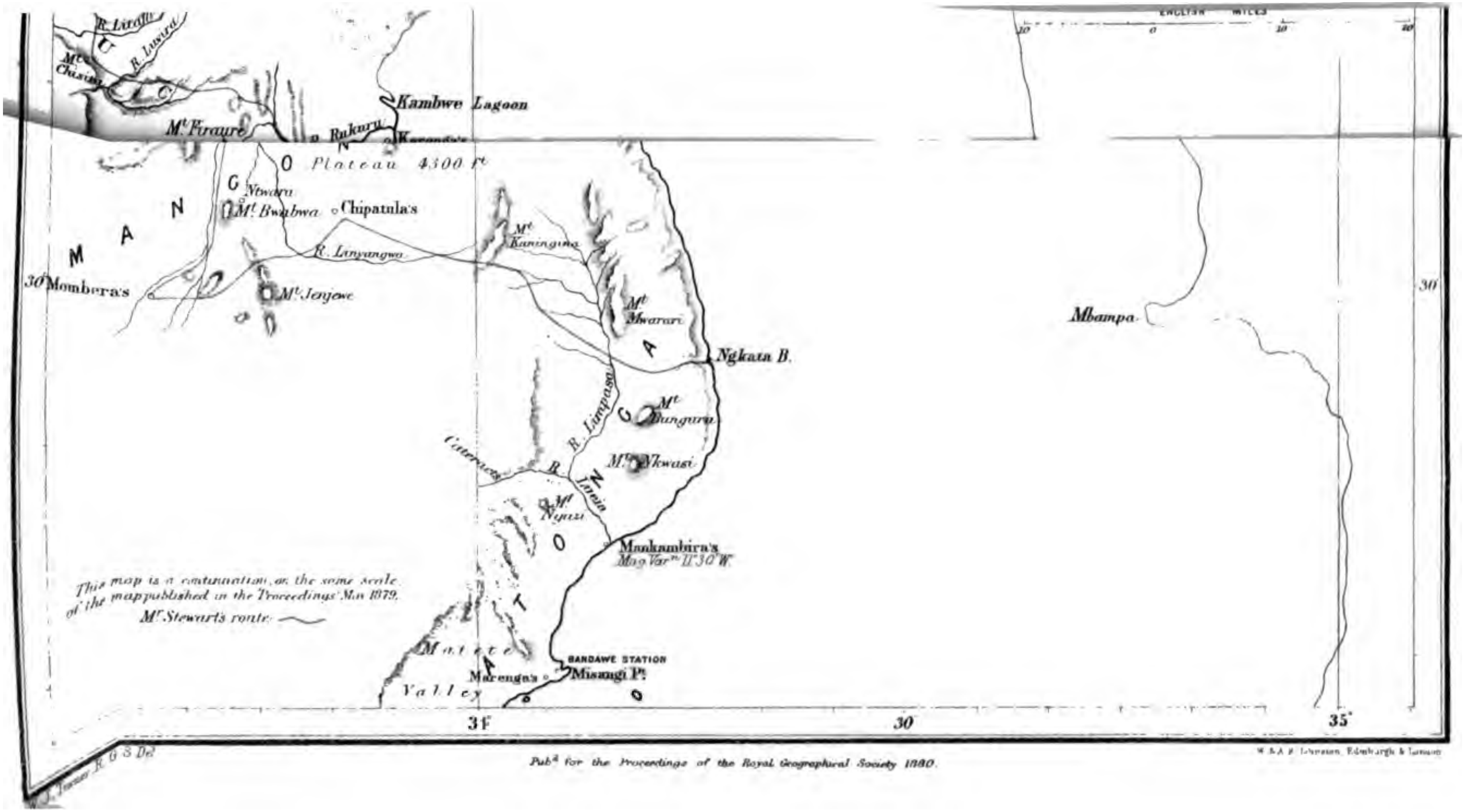
Rand, McNally, & Co.—New Official Railway Map of the United States and Canada. Scale 1 : 4,500,000 or 62·5 geographical miles to an inch. Engraved and printed by Rand, McNally, & Co., Chicago, 1880. Price 2*s.* 6*d.* (*Trübner.*)

AUSTRALIA.

Forrest, Alex., F.R.G.S.—Map showing the route from Nickol Bay to S. A. Telegraph, which was followed by the Expedition despatched by the Western Australian Government in 1879, under the command of Alex. Forrest, F.R.G.S. Scale 1 : 2,250,000 or 30·3 geographical miles to an inch. Surveyor-General's Office, Perth, 1880.

On this map is given a "Description of Country between De Grey River, Beagle Bay, and Katherine Station," also two inset maps:—1. "Part of Australia," showing route of Expedition. 2. "Map showing Geological Features of the Country passed through," from data by F. W. Hill.

Petermann's 'Geographische Mittheilungen.'—Karte von Australien zu Übersicht der neuesten Reisen ins Innere, sowie der Eisenbahnen und Telegraphen. Scale 1 : 10,000,000 or 136·9 geographical miles to an inch. Petermann's 'Geographische Mittheilungen.' Jahrgang 1880, Tafel 11. Justus Perthes, Gotha. (*Dulau.*)



This map is a continuation, on the same scale of the map published in the 'Proceedings' Mar 1879.

Mr Stewart's route ⁓

E. J. Turner R.G.S. Del.

Pubd for the Proceedings of the Royal Geographical Society 1880.

W. & A. K. Johnston, Edinburgh & London

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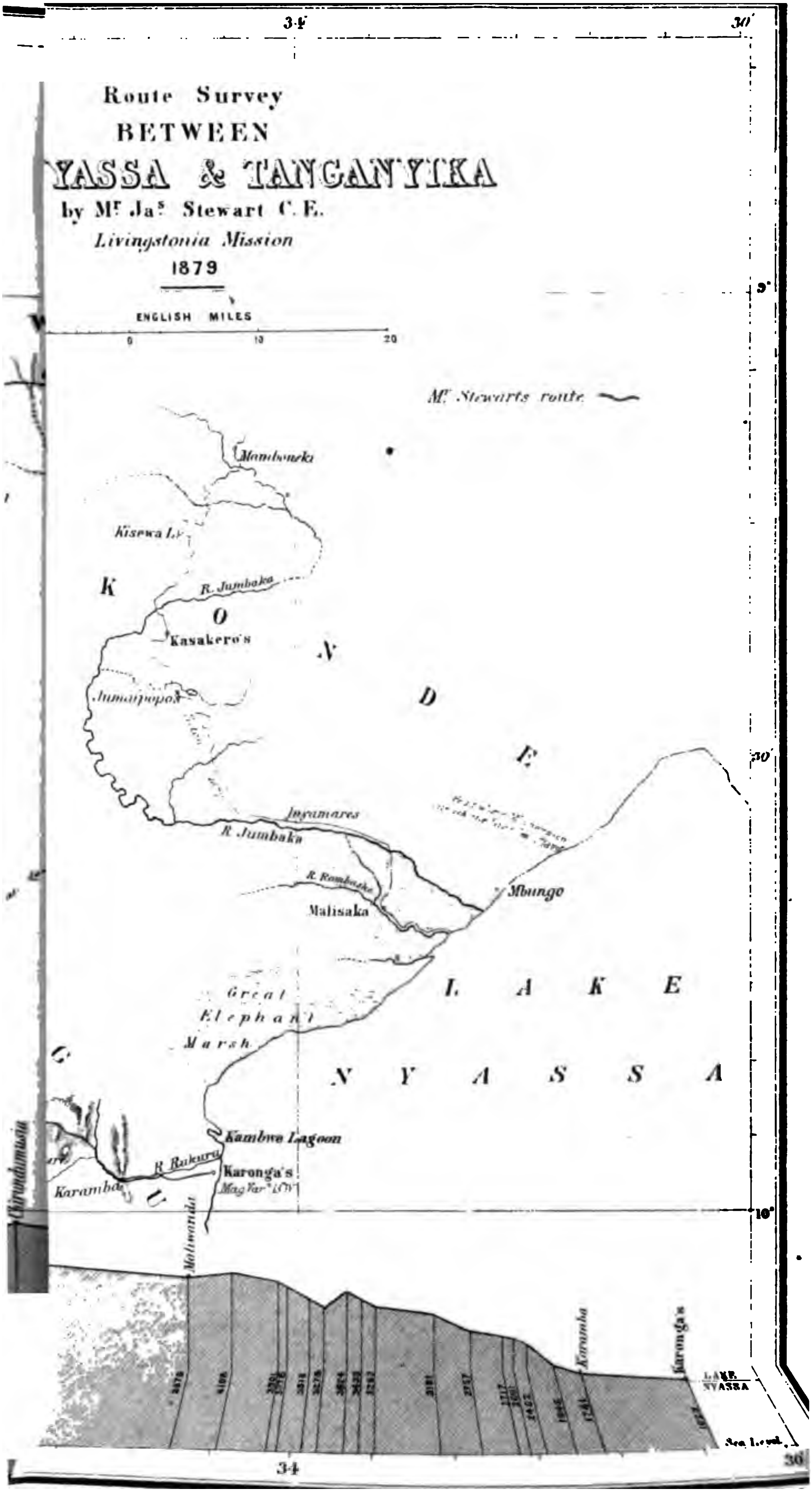

Route Survey
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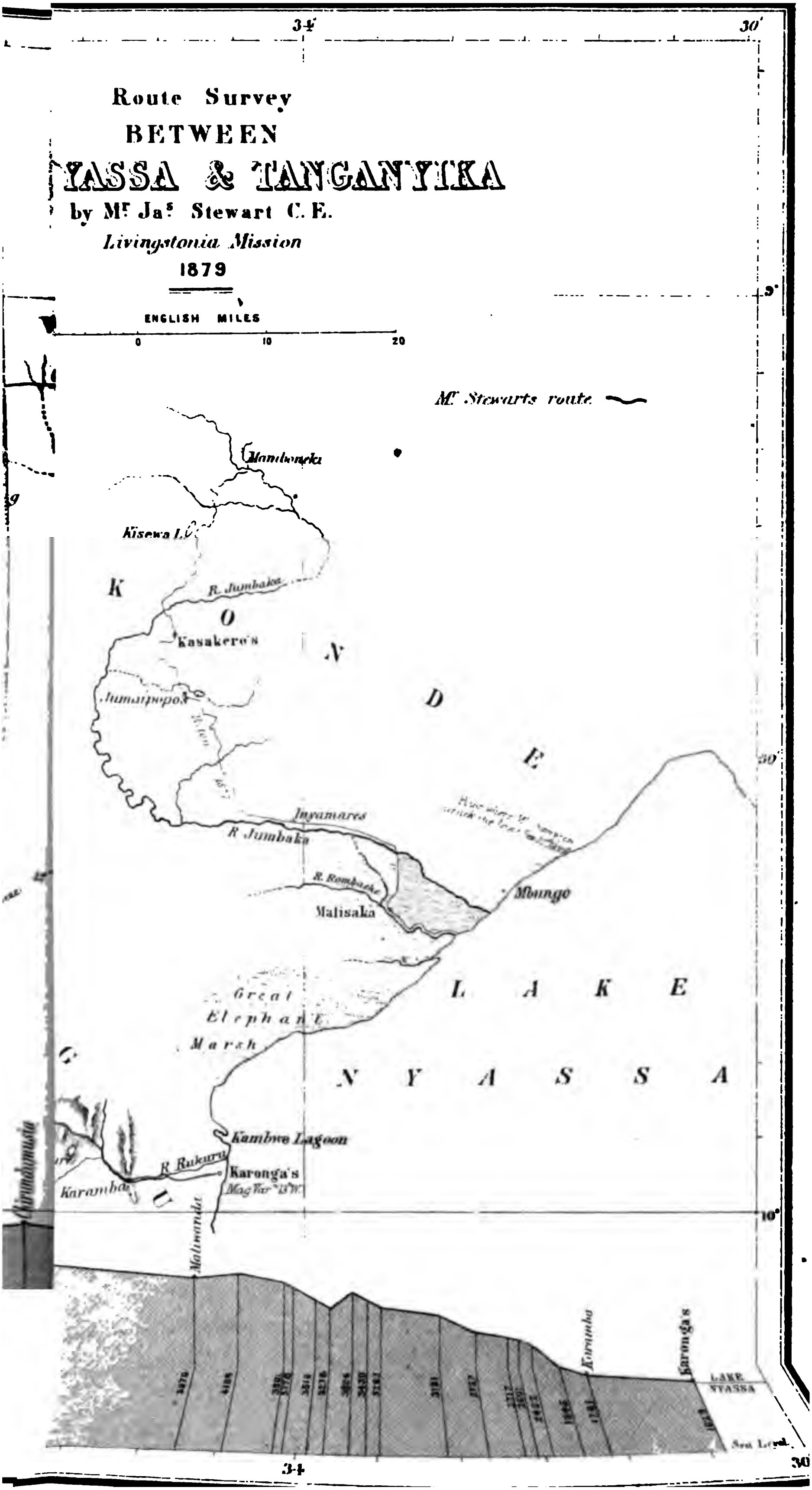

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PROCEEDINGS

OF THE

ROYAL GEOGRAPHICAL SOCIETY

AND MONTHLY RECORD OF GEOGRAPHY.

A Journey in the Interior of British Guiana.

By Everard F. im Thurn.

(Read at the Evening Meeting, May 10th, 1880.)

Map, p. 528.

For three years I have been superintending and collecting for the museum in Georgetown, the larger of the two only towns of British Guiana, or, as it is more commonly called, Demerara. In the course of my work I had to make various long journeys in the uninhabited interior of that country. It is of one of these journeys, which lasted from January to July of 1878, that I propose to speak to-night.

British Guiana is an oblong strip of country, considerably longer than broad, one of the ends of which forms part of the sea-coast of the north-eastern shoulder of South America. Various large rivers, rising in the interior, and running down to the sea parallel to each other and to the longest direction of British Guiana, alone give access to much of the interior.

The country may be said to consist of four tracts, lying one beyond the other, parallel to the coast-line. Of these, only the outermost, the sugar land, which lies next to the sea-coast, is at present cultivated and inhabited to any considerable extent. Next to this is what may be called the timber tract, from which alone timber has as yet been remuneratively brought to market. This extends toward the interior, as far as the lowest cataracts on the various rivers. It is at present impossible to cut timber profitably beyond the cataracts, owing to the difficulty of carrying it to market. So that an imaginary line roughly parallel to the sea-coast, and cutting each of the great rivers at their lowest cataracts, marks the furthest limit from the coast of this tract. This part of the country, which is inhabited only by a few negroes and Indians, once contained much valuable timber, which was readily brought to market along the highways formed by the rivers and creeks. But this has now been felled and destroyed, and it is no longer easy to find any spot at which it is worth while to set up the large and expensive plant necessary for remunerative timber-cutting, so that unless means are taken to allow these forests to recover, and to maintain a succession of large and valuable trees, or unless highways are opened into new places, the timber trade of the colony must before long come to an end.

The two remaining tracts are entirely uninhabited except by a few widely-scattered Indians of four or five different tribes. The forest tract immediately succeeds the timber tract, and, lastly, furthest from the coast, lies the savannah tract.

The former of these is everywhere covered by dense forests, as yet untouched by the wood-cutter, and consisting largely of the two most valuable trees of the colony, greenheart (*Nectandra Rodiæi*), and mora (*Mora excelsa*). The land is generally low and flat, rarely rising in rocky and undulating slopes, and still more rarely forming a solitary mountain or range of mountains. The best idea of the nature of this part of the country may be obtained by climbing to the top of some one of these hills, and looking down on the great and wide sea of tree-tops ending only at the horizon, and unbroken, except where here and there a long narrow thread of white mist, lying over the trees, marks the winding course of some small stream.

The last of the tracts is formed by the savannahs of the interior. These must be distinguished from the so-called savannahs of the coast and forest regions. Nearly all the small creeks or tributary streams of the coast and forest tracts rise in treeless marshes, often inundated, and these are also spoken of as savannahs. Again, along the banks of the Berbice and Corentyn rivers, not far from the sea, there are considerable patches of open grass-land. But the chief savannah, that which forms the Savannah tract, is of all the land of British Guiana furthest from the sea. It borders on the Brazils, from which it is only separated by the Cotinga and Takutu rivers, and it forms part of the great grass-plains which occupies so much of the interior of South America. Our share of this huge meadow is about 14,000 square miles in extent.

Of the rivers which traverse British Guiana, passing through each of these four tracts, the Essequibo is the largest and most important. It was up this river that I made my way in 1878 on to the Savannah, over which I passed on into Brazilian territory.

A line of steamers, subsidised by the colonial government, runs from Georgetown along the coast to the mouth of the Essequibo, where they touch at the island of Wakenaam. Three times a week a smaller steamer runs from here up the river for a distance of about thirty-five miles, partly for the convenience of the few who travel in that direction, but chiefly for government purposes, the penal settlement of the colony being situated on the Mazeruni, a large tributary of the Essequibo. From Bartika Grove, at the junction of the Mazeruni with the Essequibo, the steamer passes up the former river. As our course lay up the Essequibo, I left the steamer at Bartika Grove, where one of my companions met me with a crew of Indians of the Macusi tribe, who were to go with us as boat-hands.

Our party consisted of my friends, Messrs. Flint and Eddington, myself, and some dozen Indians.

For some distance from Bartika Grove we passed through scenery which, if somewhat monotonous, is yet extremely beautiful, and is characteristic of this timber tract. The river in this part varies from about one and a half to two miles in width. A few islands of various sizes are scattered through the reaches. The banks on both sides of the river, as well as the islands, are everywhere clothed, down to the edge of the water, with rounded masses of foliage, generally laurel-like in character, and really, though not apparently, rising to a great height. The whole scene is on so gigantic a scale that these forests seem hardly more than low bush. There was but little flower to add to the colour; but here and there, highest among the banked foliage, a mora tree, breaking into new leaf of various shades, white, pale liver-coloured, a deeper red, and occasionally even a deep bright crimson, stood out in vivid contrast with the varied greens of the surrounding trees. Lower on the bank of foliage, the large white and crimson flowers and huge dark pods of the wild chocolate tree (*Pachira aquatica*, Aubl.) attracted the eye to where small flights of day-bats, startled by our passing boat, flitted about among the roots which rose from the water in the shadow of the overhanging trees.

Some 15 miles above the Grove, the river suddenly contracts to a width of less than a quarter of a mile, forming a narrow reach called the "Monkey Jump," through which the current forces its way with great violence. Passing through this we came out in a very few minutes into a new reach of the river, wider than before.

With a careful pilot a small steamer might penetrate a little beyond the "Monkey Jump," to a point a few miles before the first falls on the river at Aretaka. A few years ago a path was cut through the forest from this highest point navigable for a steamer to the Kaieteur Fall on the Potaro River, which in height, volume, and in the beauty of the surrounding scenery, must rank among the very finest falls in the world. Probably, however, it will be long before this path, which was cut under government direction in the hope of attracting strangers, is made easy enough for the ordinary traveller. At present it has not been once used, and much of it is already obliterated by the rapid growth of tropical vegetation.

Opposite to the point from which this path starts stands Moraballi, a cluster of three houses, inhabited by a woodcutter and his family, and interesting to us as the last civilised houses which we were to see for six months.

Leaving Moraballi, we soon reached the furthest point to which the tide runs. This is some 60 miles from the sea, at the first rapids, called Aretaka, which separate the timber from the forest tract. These rapids interrupt the course of the river for upwards of 15 miles, and are very similar, differing probably only in their greater or less length, to most of those which obstruct the rivers of Guiana and render their navigation difficult; so that a description of these will serve to give a general idea of all.

In Aretaka Rapids it is impossible to form an idea of the real width of the river. As far as the eye can see is a vast extent of water from which rise many rocks and islands of all sizes. The rocks sometimes stand singly, sometimes in groups, sometimes are piled in large numbers one over the other; some of these support a few water-guava bushes or even a few stunted and gnarled trees. The larger islands are generally covered with trees, and often, from their extent, are hardly distinguishable from the banks of the river. The water rushes, gurgling and foaming, in all directions among the boulders. A few banks of yellow sand crop out among the rocks. It was normally the dry season, and an abnormal drought had prevailed for a year and a half, so that the bed of the river was even more exposed than usual.

On the larger islands and on the banks of these rapids live a good many Indians, chiefly Caribs, and a few half-breeds between negroes and Indians, called "Cobungrus." These latter retain the many good qualities of the Indian, and to these they add the few good qualities, such as physique and strength, of the West Indian negro. We took up our quarters for a few days at the house of one of these Cobungrus, a finely built man named Cephas, more than half Carib, who held by commission from the governor of the colony the oddly combined offices of rural constable and chief of the Indians of the Essequibo River. His curly hair gave indication of this black blood, but in all other respects he looked and lived a true Indian. As he limped down to meet us under the trees at the waterside, his naked red skin, relieved only by the usual dark-blue lap or loin cloth, and by a splendid necklace of highly polished teeth of bush-hogs or peccaries, he was certainly a picturesque figure. The cause of his limp was evident in a horrible-looking wound conspicuous on one shin. This had been produced twenty-seven months previously by the bite of a large snake, bushmaster. The wound kept him in his hammock for fifteen months, but since that he had been able to get about as freely as ever except for the odd hopping action in his walk.

Some little distance from the river, on top of a hill, the three or four huts which form the settlement stand in a clearing walled by tall forest trees. Among the charred trunks of felled trees which lie in all directions in this clearing, cassava and other plants cultivated by the Indians grow intermingled with wild seedlings and shoots from the stumps of the trees which once stood there; and the whole is densely matted together by yam vines and by razor grass (*Scleria scindens*), and other wild creeping plants.

The houses consisted only of four posts supporting a roof of palm leaves. The women were at the moment engaged in making cassava bread. The rich red colour of their skin, made yet more red by paint, the red waistcloths which formed their only dress, the red-dyed cotton bands which were fastened round their legs below the knee and above the ankle, the vast quantities of red beads round their necks and waists, and the many red-stained cotton hammocks slung in the houses made up a striking picture—a harmony in red and brown.

As on every other occasion in which I have taken up my quarters in the houses of Indians of various tribes, the people were civil, hospitable, and pleasant.

One day passes very like another to the traveller as he ascends the river in his canoe. During the first two days we were slowly making our way up the Aretaka Rapids. The rocks, on account of the unusual dryness of the season, were very much exposed, and the water-channels between them, though numerous, were both narrow and shallow. The canoes often had to be dragged by main force over the rocky floor. Where the channels were deeper the water rushed down more violently, and it was difficult to haul the canoes against the current. But the Indians worked wonderfully. Some swam, and had hard work to keep their course in the rushing water. Others, up to their waists or even up to their necks in water, stood on half-submerged rocks hauling by means of ropes attached to the canoes. All laughed and shouted, but the roar of the river half drowned their noise. The only woman of the party worked at least as energetically as the men. Once she suddenly lost her footing, slipped, and was swept down the river, the current carrying her right under the canoe. The half-terrified, half-amused expression on her wholly hideous face, when it reappeared from under the water, was most ludicrous. She swam like a fish, and was soon running on the rocks, and pulling again as strongly as ever. All Indians, men and women alike, swim splendidly, but with a peculiar action. The legs are hardly spread, but are bent somewhat downward at an angle to the trunk, and are then suddenly again straightened, thus driving forward the body of the swimmer.

One curious feature in the rocks was especially noticeable, on account of the dryness of the season. The rocks, especially those lying lowest in the bed of the river, have a curiously glazed, black, and vitrified appearance, due to the presence of oxides of iron and manganese. On speaking about this to the Indians, they at once silenced me by the assertion that any allusion to this appearance would cause rain to fall.

The Indian who was the spokesman on this occasion was a Macusi boy named Moï. He was returning to his home on the Savannah after having spent two years in the service of a coloured man in Georgetown, where he had learned to speak English and to wear clothes. It was strange how quickly he now fell back into his old Indian habits. Even on the first day he threw off his clothes and resumed the ordinary Indian lap, a narrow strip of cloth passed between the legs, and suspended in front and at the back on a string tied round the waist. As he moved about among the other Indians, it was very evident that the clothes which he had worn for two years had made his skin become much fairer in tint. Strangely enough, he alone of all the Indians looked naked, and it was some months before the lighter tint of his skin, with the consequent effect of nakedness, disappeared.

The banks of the Essequibo above Aretaka are almost uninhabited, even by Indians; throughout the several hundred miles of country through which we passed between Aretaka and the mouth of the Rupununi, we came across but three or four settlements. Our camps, therefore, were generally made in the forest. As, however, Indians are continually passing up and down the river, there are certain recognised camping places, from which the bush has been cleared. Sometimes, however, when as night approached we were not near one of those places, we had to clear ground for ourselves in the bush. The nights spent in the open air in the tropics are a pleasant memory. By the time the camp was ready the daylight had faded, and our fires alone threw round a circle of flickering light, contrasting strangely with the darkness of the surrounding forest. Where the firelight was strongest the Indians lay, smoking and talking, in their hammocks, close to each of which was a fire, which occasionally flared up and seemed to lick the naked skins of the Indians through the meshes of the hammock. Not content even with this, the Indians sometimes made the boys take lighted palm leaves and singe them as they lay in their hammocks, this strange proceeding being intended to destroy savage insects.

One by one the Indians fell asleep. Various kinds of frogs kept up an almost deafening concert of marvellously varied croaks, some musical, some most unmusical. One imitated the beat of paddles striking in regular time against the sides of a canoe after the Indian custom; and the likeness was the more deceitful because the sound alternately rose and fell gradually as though a canoe came up the river, passed the camp, and was then paddled up stream out of ear-reach. Often and often I have lain long in doubt whether the sound heard was caused by paddles or by frogs. And while the frogs croaked, every now and then a night-jar flitted swiftly and most silently by, and then suddenly shrieked out its loud cry of "*Work-work-work-to-hell.*" Or another and larger species began to moan out the four notes of its most hideous and depressing cry, sounding them in rapid succession, the first shrill and high-pitched, each of the succeeding ones lower, and the last almost an inaudible moan. It is only comparable to the cry of a despairing and dying human being. At times was heard the noise—something between a snort and a bellow—of a cayman; and at other times mysterious sounds, resembling the crack of pistol shots, which I afterwards found were caused by caymen raising their tails into the air and bringing them down sharply on the surface of the water.

Toward morning the loudest and most appalling noise of all broke out. Beginning suddenly in a deep roar, it became louder and louder, till the whole forest rang with the din. It is hardly possible on first hearing this to believe that the terrific roar is produced only by the somewhat small red howling monkey (*Mycetes seniculus*), called baboon in the colony.

Before daylight the Indians were out of their hammocks, making preparation for the coming day's journey. A plunge into the river was the first thing. In the early morning the temperature near the river is comparatively low; though the thermometer stands perhaps at 70°, the air feels as chilly as on an autumn day in England, and the water, having retained much of the warmth imparted by the sun of the previous day, seems by contrast like that of a warm bath.

And now the sounds and sights of the day began. Some toucans, perched on the very highest boughs of a tall tree, were revelling in the morning sun, and greeting it with their usual yelping cries. Emphasis is given to each puppy-like yelp by an odd and comical antic; the head is jerked down, the tail lifted almost at right angles to the body. Flights of parrots, crying shrilly, began to pass over the river to their feeding grounds, flying so high that their colours were not to be discerned. From the forest the "pai-pai yo," or greenheart bird (*Lipangus cineraceus*), began incessantly to cry its own Indian name; this is probably the commonest bird in the forests of Guiana, and its shrill cry, heard nearly all day long, is the most characteristic sound of these forests.

Having no meat, we stopped early in the day to hunt. Half the booty, a young tapir, was given to the Indians, who, as usual, immediately boiled and ate it; for an Indian, when he gets meat, is never satisfied until it is all eaten, after which he contentedly does without animal food until he has sufficient energy to go and procure a fresh supply. The other half of the booty was put on a babracot to dry. A babracot is a small stage of green sticks, built some two feet above the fire, on which the meat is placed and smoked. Meat treated in this way, though it loses its distinctive flavour, keeps good for many days even in that climate. Before starting from the camp the next morning the Indians destroyed the babracot, saying that if a tapir, passing by that way, found the babracot, it would come by night on the next occasion on which an Indian slept at that camping place, and catching the said Indian, would forthwith babracot him, tit-for-tat.

The days spent in travelling along the smooth reaches of the river were more monotonous, though even there the scenery is beautiful. As among the falls, innumerable islands, some of considerable extent, stud the river and hide its real width from the eye. The beauty of the scenery is in great measure due to the effect of the distant views as seen between the approaching headlands of each two of these islands. The traveller from his canoe in the centre of a lake-like expanse of still water, in the midst of a group of these islands, sees the water flowing toward and from him, through many channels, each of which is framed by the trees overhanging from two neighbouring islands. In the more open reaches of the river, in the dry season when the water is low, banks of bright yellow sand swell up from the water, and either form islands, often of very considerable extent, or fill the bays in the curves of the river banks. Twice in each year, when at the end of each wet season these sandbanks show above water, the river turtles, which are very numerous, lay their eggs in the sand; and gull-like razor-bills (*Rhynchops nigra*) make their uncovered nests on the sand, and wheel about over them incessantly uttering their harsh cry.

One evening we reached a hut on the Paripie Creek belonging to some half-bred Brazilian Indians. These people, called Nikari-karus, are hybrids between Brazilians and Indians of various tribes. Their proper home is on the frontier of British and Brazilian territory; and the few settled on the Essequibo are deserters from the frontier forts and cattle farms, where, at any rate till recently, the labour done was forced.

Another day, at Warraputa Cataracts, I for the first time saw the rock-pictures which form so strange an addition to some of the landscapes of this part of South America. A large number of somewhat conspicuous figures are engraved on the surfaces of a group of granite boulders in the very midst of the cataract. The figures represent men, monkeys, snakes, and other animals, and also certain simple combinations of a few straight or curved lines in a pattern, and occasionally more elaborate combinations. The individual figures are small, averaging from 12 to 18 inches in height, but a considerable number are generally shown in each group. There is another form of pictured rock which occurs in places in Guiana. The two principal forms may, for the sake of convenience, be distinguished as "deep" and "shallow" respectively, according as the figures are deeply cut into the rock—as are those at Warraputa—or are merely scratched on the surface. The former are from one-eighth to half an inch, or even more, in depth; the latter are of quite inconsiderable depth. The two kinds seem never to occur in the same place, or even near each other, and they also differ in the kind of subject which each represents and in various other points. No theory of the origin and nature of either kind of these rock-drawings has ever been seriously proposed. Those in Guiana seem to be part of a widely scattered series of similar drawings occurring both in North and South America.

Soon after we left Warraputa, misfortunes began to attack our party. First, our bread was exhausted, and it was with great difficulty that we obtained a very scanty supply from one of the few Indian settlements which we passed. Then sickness, especially fever, appeared among us. As a similar misfortune is very likely to attack all travellers in that land, where the days are always burningly hot, the nights, by comparison, bitterly cold, and the atmosphere is always saturated with moisture, it may not be out of place to say that these attacks, though frequent and very troublesome, are but rarely dangerous.

Two other diseases, diarrhœa and ophthalmia, both of which at a later time attacked members of our party, must be carefully guarded against. Ophthalmia is extraordinarily common among the Indians, nearly every other individual having weak eyes in consequence. The disease seems very readily to infect travellers. The germs are probably conveyed from the eyes of some Indian to those of the new comer by the countless tiny flies which continually settle on the eyeball, forming one of the most serious plagues of that country. But on the whole, whatever the coast may be, the interior is not unhealthy.

Owing to the illness of so many of our party, and to the now complete failure in our supply of provisions, it was with great pleasure that, on the 14th day after our start from Aretaka, we reached the site of an old Dutch settlement, at Arinda, where a family of half-bred Brazilians have now established themselves.

Some groups of fine coffee-trees, long left untended, alone mark the site of the old Dutch settlement entered in the map published by Hartzine in 1770 as "Post Arinda." It was the highest on this river, with the exception of a small plantation, probably a branch establishment, of which Schomburgk saw traces, forty years ago, at Ouropocari, some few miles further up the river.

The Dutch had pushed so far up most of the rivers, that it seems probable that if the country had been left in their hands it would now have been fully utilised. But when their rule was confined to the comparatively small district of Surinam, their interest in the whole of Guiana cooled, and the development of the colony received a check from which it has not yet begun to recover.

After a three days' stay at Arinda, having got rest and provisions, we once more started on our way. After a few hours we passed the mouth of a creek, called Haimarakura by the Indians, from which a path leads across to the Demerara River. Neither the path nor the creek are marked in any of the maps of Guiana. The courses of the two rivers are almost parallel, and not far apart, and there are several of these connecting paths between the two. They are made and used by the Indians of the Savannah, who go by that way to work for short periods on the wood-cutting grants of the Demerara River.

At noon on the second day after leaving Arinda, we reached the falls at Ouropocari. On the rocks at the side of one of the channels of this are some more rock-drawings, very similar in character to those at Warraputa. The channels at Ouropocari being often impracticable for loaded canoes, there is a portage, or path, along which the Indians carry their canoes and their goods separately from the bottom to the top of the fall, where they reload their canoes. These portages exist at the side of nearly all the larger falls on this river, and are frequently used; but on the less-frequented rivers of Guiana it is often necessary for each traveller to make such a portage for himself. This is no easy work. The trees have to be felled and the ground cleared; and skids have to be laid at very short distances from each other along the whole path. When this has been done, the travellers harness themselves by a rope attached to the bows of the boat, like a team of horses, and the boat is very quickly drawn over.

In seven days we reached the cataracts at Rappoo. These take their name from a kind of bamboo which grows on the islands among them, and which is much used by the Savannah Indians for making arrow-heads, which are, we were told, as poisonous as those tipped with ourali. I afterwards tried one of these rappoo arrows; but the fowl which was shot showed no symptoms of poison; and an Indian who was standing by ingenuously remarked that a rappoo arrow is only poisonous when it enters far enough into the body.

From Rappoo, driven once more by want of bread, we pressed on and reached Apooterie, a Carib settlement at the junction of the Rupununi and Essequibo, long after dark on the same day. During our two days' stay here, much amusement was afforded by the tame animals which, as usual in an Indian settlement, thronged the place. Among them were more than a dozen parrots of various kinds, two macaws, two trumpet-birds (*Psophia crepitans*), two troupials (*Icterus Jamacii*), three monkeys, a toucan, some powis or curassow birds (*Crax alector*), and lastly, a sun-bird (*Eurypyga solaris*). It has been supposed that the great frequency of tame animals in the settlements of South American Indians indicates a fondness in these people for animals. As a matter of fact, an Indian regards his tame animals as so much coin, with which he can purchase what he wants from other Indians. A rude system of division of labour exists among the tribes. Those of one tribe spin cotton; those of another weave this cotton into hammocks; those of a third make pottery; of a fourth make the graters on which the cassava-roots are reduced to pulp; in short, each tribe has its own particular manufacture, the products of which it exchanges with the other tribes for the things made by them. And in this system an Indian, instead of always paying in the goods which he has made, often pays for what he wants with tame animals, that is, with coin. The birds or animals once made over to other Indians, their former owner will often, if he gets a chance, neglect them, or even treat them with cruelty. It is a fallacy to suppose that Indians, at least those of Guiana, have any natural affection for animals.

After two days' stay at Apooterie, we started again, and leaving the Essequibo passed up the Rupununi River. The water of the latter, unlike the clear, dark-red water of the Essequibo, is of an opaque, yellowish-white colour. The river is about 500 yards wide. Its banks are wooded, though far less luxuriantly than those of the main river. The water, being at that time excessively low, in places left exposed much of the high, cliff-like banks of white clay, crowned by weather-beaten trees, shrubs, and palms; in other places, long even stretches of water-guava bushes (*Psidium aromaticum* and *P. aquaticum*), looking like English osier-beds, edged the river. The palms, here much more numerous than on the Essequibo, gave character to the scenery.

The withered, scrub-like appearance of the vegetation was no doubt partly due to the neighbourhood of the Savannah, to which we were now coming near; but it was also doubtless partly due to the abnormal dryness of the previous seasons, for when I afterwards passed down this river in the high rainy season, the plant growth, at least near the mouth, was far more luxuriant, though even then greatly inferior to that on the Essequibo.

On the first day of our journey up this river, we travelled long, and at a fairly rapid rate. But on the second day the sandbanks began to delay us; and from that point they increased so greatly in size and number, that they offered a most serious obstacle to our progress. These sand-ridges, often covered only by an inch or two of water, sometimes extended right across the river. Over these it was impossible to float our large and heavily-loaded canoes. Sometimes it was possible to drag them over by main force, as over dry land; but often it was necessary to dig a channel for them with the paddles. Once we had to wait for six hours while one of these channels was dug through a sandbank of not more than 300 yards in width; and so on some occasions we did not advance 1000 yards in the day. These times of waiting were rendered almost unendurable by the great abundance of a small black fly, here called *kaboora*, and in the Brazils *pium* (*Simulium?*). From the Atlantic to the mouth of the Rupununi, the country is quite free from these terrible little blood-suckers; but on this river they abound, as they do generally westward, especially on the rivers of the Amazon system. Wherever they settle on the flesh, a small round patch of raised skin, distended by blood, is formed, and is very sore and troublesome. The naked bodies of the Indians, who, their hands being occupied with the paddles, could not protect themselves, were so covered with the marks of these insects that it was sometimes difficult to detect any sound skin. Where these insects occur they are far more annoying than mosquitoes, which, abundant and almost universally distributed as they are on the coast-land, are only very locally distributed in the interior.

We slowly crept on for some time, but gradually made less and less progress each day. The labour of digging through the sandbanks and of dragging the canoes over by main force began to tell on the Indians, who grew weary and disheartened. Cassava bread, which is almost essential to their health and comfort, had again failed us. Some of them who, like most Indians, had been sleek and fat, suddenly and in the course of but a day or two, became so thin that they looked hardly more than skin and bone. Nothing about Indians is more striking than the extreme rapidity with which they lose flesh and strength, and as suddenly regain these when circumstances become more favourable. This is probably due to the immense amount of paiwarie, a drink made of chewed cassava bread allowed to ferment in water, which they consume, and which makes them sleek and fat without giving any real stamina.

One after another, ill, weary, or lazy, our men gave up working. One afternoon when with infinite pains the canoes had been got half-way across a sandbank in a wide reach of river, the Indians declared they could not and would not move them further that day; so we had to wade up the river for about a mile until we found camping ground. Then the men spoke of a small settlement called Morai, not far from where we were. We sent there to get bread, but the messengers returned without any. They found the huts, but the people were almost famishing; and they brought back most ominous accounts of the famine which the long continued drought had caused in the Savannah.

The next day the crisis came. We had been creeping on, even more slowly than usual, for about two hours, when we again stuck on a sandbank, and the men declared it to be utterly impossible to move the canoes forward or backward. There was nothing to be done but to form a camp in the bush and consult as to the next move.

We were then about a day's walk—the distance by land being considerably less than by water—from a considerable Macusi settlement called Quartama. Eddington, who was at the time the strongest of the party, undertook to go on to this settlement, and there, if possible, to procure fresh crews, as well as a supply of provisions.

Four most tedious days we waited for him; but in the middle of the fifth night he returned with a set of merry, shouting Macusis very different from the disheartened set who had brought us so far. He also brought back an abundant supply of cassava, and the welcome news that a further supply would be waiting for us at Quartama.

Very hopefully did we start the next day. The new men worked splendidly. The character of the country also began to change. For some time past a comparatively narrow belt of forest on each side of the river had alone separated us from the Savannah; but now even this belt failed in places, and the open Savannah came down to the river. After having been shut up for nearly two months in a dense, damp forest, to reach open country, to see a really wide plain, and to feel a real breeze, seemed to give new life. So we soon reached the "waterside" of Quartama.

After this the rest of our canoe journey passed quickly and pleasantly. The only drawback was the growing report of famine which met us at the settlements which now became more numerous. At Quartama we had certainly found abundance, but everywhere else there seemed to be great scarcity. Whole settlements were deserted, and in others, where a few old or infirm people remained, nothing but the seeds of palms and other plants were eaten.

The change in the scenery continued and grew greater. The places where the Savannah came down to the river became more numerous; and in no place were the two separated by more than a very narrow line of trees. In one spot a mountain, bare of trees up to its very top and with rocks cropping up here and there from the scanty herbage on its sides, afforded an entirely new feature in the scenery. A mountain, or even a hill, is most interesting in Guiana.

One evening, at a creek called Mopai, we camped near a pond full of the splendid flowers and gigantic leaves of the royal water-lily (*Victoria regia*). Such a scene, in the soft and yet intense evening light of the tropics, is exquisite beyond description. Round the pond was a wall of dark forest. Water-fowl abounded. Dainty spur-wings (*Parra jacana*) ran about on the lily leaves, and one of these birds had a nest on a leaf. High over head a flight of large white cranes passed in Indian file to their night's rest. Flocks of vicissi-ducks (*A. autumnalis*) rose and flew by, whistling out their name, "vicissi! vicissi! vicissi!" and—a more practical matter—several fine muscovy ducks (*A. moschatus*) rose, and fell to the guns.

At last, on the 22nd of March, about midday, we reached our destination at Pirara landing, and so came to the limit of our canoe journey, having taken forty-nine days to do what, under ordinarily favourable circumstances, ought to be done in about twenty.

That night the Indians kept up a great firing of guns to attract the people from Quatata and Karenakru, two settlements respectively nine and fifteen miles distant, across the Savannah. They were wanted to carry our goods; for our own men when they reached the landing place considered their duties at an end. At earliest dawn, the shrill sounds of Indian music were heard from a distance, and grew louder and louder. Then the Macusis began to arrive in family parties, walking in single file, many of them playing on flutes made of the bones of jaguar or deer. In each party the men and boys came first, carrying only their bows and arrows; after these came the women, burdened with the hammocks and other chattels of the whole party. This went on at intervals throughout the day, and again early the next morning; probably about 60 Macusis came down in all.

When the last packet of goods had been carried off, we ourselves started to walk to Quatata, which was to be our head-quarters for some months. The undulating Savannah is chiefly arranged in parallel ridges, hills and valleys, sometimes large and sometimes small, rapidly succeeding each other. The soil changes often and abruptly; sometimes it is peaty (pegass), sometimes hard and impregnated with iron, sometimes gravelly, sometimes sandy. But whatever its nature, the soil, on the hills, is somewhat scantily covered by tufts of coarse grass, from which rise a few wind-blown, sunburnt shrubs; occasionally the tops of these hills are even so thickly covered by shrubs, that from a distance they look almost well wooded. But in the moist valleys, of which some are mere strips, lying between the ridges of higher ground, while others are vast perfectly level plains, many miles in extent, the grass is high and luxuriant; and these level plains are made beautiful by groups and forests of Æta palms (***Mauritia flexuosa***), each with its exquisite crown of green fan leaves rising from a hanging fringe of older, withered leaves. The rising ground is everywhere dotted over with the huge nests of ants or termites, from two to ten feet high, built of yellow clay, and looking like very pointed haycocks. Sometimes again, but at long intervals, stand palm-thatched, domed Indian houses, looking like haystacks. As a background to all this, in the far distance, on the right, is the Pacaraima Range, and on the left are the Canakú Mountains.

On high ground midway between these two ranges stands the settlement of Quatata, within half a mile of the site of the now extinct settlement of Pirara, which, about the year 1840, was the scene of a dispute between the British and Brazilian authorities. An English missionary having settled at Pirara, Brazilian soldiers were sent from Fort S. Joaquim on the River Branco, to seize the place and turn out the missionary, on the plea that the place was within Brazilian territory. Troops having been sent up from Georgetown to re-assert British rights, the Brazilians quietly retreated back to their own territory. Since that time, though the Brazilians have never formally resigned their claim, there has been no attempt to dispute our title to the country as far as the Takutu and Ireng rivers.

At the end of our walk to Quatata, it was not pleasant to find th
not only food, but water also, was fearfully scarce. In ordinary tim
there is a sufficient supply of the latter in a small river which runs p
the foot of the hill on which Quatata stands. But in this extraordina
season, in one pool only was there a little water, thick and milk-wh
with clay, and unpleasantly tainted with iron.

Quatata, which is one of the largest settlements in the Savanna
consists of ten houses, all oval or round. These, as always on t
Savannah, are not mere open sheds, as in the forest, but have very thi
walls of wattle and mud, surmounted by high conical roofs of pal

thatch. The very cold winds which at night blow across the Savannah, have probably induced the building of these walls. Another distinctive feature of the Indian house on the Savannah, is that there are no signs of cultivation round them.

At first, constant attacks of fever, and the difficulty of moving about in a famishing country, prevented our undertaking any distant expeditions; but there was very much to interest even in the immediate neighbourhood. From the foot of the ridge on which Quatata stands a vast and level plain, covered by luxuriant grass, extends toward the Brazilian frontier. In the far distance this plain is bounded by the Pacaraima Mountains. The plain is the so-called Lake Amuku, or Parima, or the "White Sea," the supposed site of the fabled golden city of El Dorado or Monoa. The so-called lake is at almost all seasons a dry plain, on which lines of Æta palms mark the courses of small streams, the overflow of which, in very wet weather, occasionally turns the plain into a lake.

Once, about this time, when I was suffering from slight headache and fever, a peaiman, or medicine man, offered to cure me. It was too good an opportunity to be lost, and I accepted. An hour or two after dark I carried my hammock to the house where the man was living, and there re-slung it. According to request, I had brought with me a pocketful of tobacco leaves. These were now steeped in a calabash of water, which was then placed on the ground. The peaiman had provided himself with several bunches of green boughs cut from the bushes on the Savannah. The entrance to the house having been closed, we were completely shut in; for the house, as usual among the Savannah Indians, was walled and without windows or chimneys. The fires having been put out, all was dark. Beside the peaiman and myself, there were about thirty Indians in the house, most of them attracted by such a novel performance as the peaiing of a white man. We all lay in our hammocks; and I was especially warned not to put foot to the ground, for the kenaimas, or evil spirits, would be on the floor, and would do dreadful things if they caught me.

For a moment all was still, till suddenly the silence was broken by a burst of indescribable and really terrible yells and roars and shouts, which filled the house, shaking the walls and roof, sometimes rising rhythmically to a roar, sometimes sinking to a low, distant, and sounding growl, but which never ceased for six hours. Questions seemed to be thundered out and answers shouted back, words and sentences, questions and answers, following each other so closely that there was no pause in the sound. To me, knowing very little of the Macusi language, the meaning was unintelligible; but so long as I kept my senses, a Macusi boy, who spoke English, and who had slung his hammock close to mine, did his best to whisper into my ear some sort of a translation. It was the peaiman, he explained, roaring out his questions and commands to the kenaimas, who were yelling, and shouting, and growling their answers.

Every now and then, through the mad din, a sound was heard, at first low and indistinct, and then gathering in volume, as if some big winged thing came from far toward the house, passed through the roof, and then settled heavily on the floor; and again, after an interval, as if the same winged thing rose, and passed away as it had come. As each of these mysterious beings came and went, the air, as if displaced by wings, was driven over my face. They were the kenaimas coming and going.

As each came, his yells were first indistinctly heard from far off, but grew louder and louder until, as he alighted on to the floor of the house, they reached their height. The first thing each kenaima did, was to lap up some of the tobacco-water, with an ostentatious noise, from the calabash on the floor. But while he lapped, the peaiman kept up the shouts until the kenaima was ready to answer. When each kenaima had given an account of itself, and had promised not to trouble me, it flew rustling away. They came in the form of jaguars, deer, monkeys, birds, turtles, snakes, and of Ackawoi and Arecuna Indians. Their voices were slightly different in tone and were supposed to be appropriate to their forms.

It was a clever piece of ventriloquism and acting. The whole long terrific din came from the throat of the peaiman; or perhaps a little of it from that of his wife. The only marvel was that the man could sustain so tremendous a strain upon his voice and throat for six long hours. The rustling of the wings of the kenaimas, and the thud which was heard as each alighted on the floor, were imitated, as I afterwards found, by skilfully shaking the leafy boughs and then dashing them suddenly against the ground. The same boughs, swept through the air close by my face, also produced the breezes which I felt. Once, probably by accident, the boughs touched my face; and it was then that I discovered what they were, by seizing and holding some of the leaves with my teeth. Once, too, toward the end of the performance, and when I had lost nearly all consciousness, a hand was, I thought, laid upon my face. That, as will presently appear, was the crisis of my illness.

The effect of all this upon me was very strange. Before long I ceased to hear the explanations of the boy by my side, and passed into a sort of fitful sleep or stupor, probably akin to mesmeric trance. Incapable of voluntary motion, I seemed to float in the midst of a ceaselessly surging din; my only thoughts a hardly-felt wonder as to the cause of the noise, and a gentle, fruitless effort to remember if there had once been a time before the noise began. Now and then when the noise all but died away for a few minutes, during intervals in which the peaiman was supposed to have passed out through the roof, and to be heard from a great distance, I woke to half consciousness; but always as the peaiman came back and the noise grew again, I once more to a state of stupor. At last, when toward the morning the noise d finally ended, I awoke thoroughly. The bars being taken away m the entrance to the house, I passed out on to the open Savannah. was a wild and pitch-dark night; rain fell heavily; thunder pealed cessantly, and every now and then the lightning, flashing from behind e far off Pacaraima Range, vividly showed the rugged and dark edge the mountains against the sky. Bareheaded, barefooted, and coatless, pent the short time before dawn out in the storm; and the Savannah, e night, and the storm seemed strangely fresh and pleasant after the rk, close, noise-filled house.

It is perhaps needless to add that my head was anything but cured its ache. But the peaiman, insisting that I must have been cured, ked for payment. He even produced the caterpillar which, he said, d caused the pain, and which he had extracted from my body at the ment when his hand had touched my face.

For some time after our arrival the famine continued to increase; erever we went, the houses were either deserted or the people were ing on seeds, caterpillars, ants, and boiled grass and leaves. But t when matters were at their worst, when it was almost impossible get food, rain at last came. It was never very abundant, but it ved to revive the dying cassava and other plants. The effect on the vannah was wonderful. When the rain came, in two days the vannah began to look bright, green, and flowery.

On one of the early days in May, Eddington and I started to visit frontier fort of S. Joaquim, in Brazilian territory. In that neigh- rhood there are large cattle farms belonging to the Brazilian Govern- nt, and our chief object was to visit these. Three days' walking oss the Savannah brought us, after crossing the Nappi River near its d-waters, to Euwara-manakaru, a Nikari-karu settlement. Here we ed to get guides and interpreters, and to hire canoes in which to cend the River Takutu. In both these matters we succeeded; but had, as usual, to wait some days before we could get our new allies move.

Very little is known about the Nikari-karus, who are an ill-defined up of hybrids between Brazilian Portuguese on the one hand, and lians, possibly Wapisianas, on the other. Their language is a much rupted form of Portuguese, almost unintelligible to speakers of uine Portuguese. Perhaps the most striking thing about them is habit, which some of them have adopted from various Brazilian es of Indians, of filing each tooth to a sharp point, thus giving heir faces a most savage and hideous expression.

One point of interest in this neighbourhood was the comparatively uent occurrence of stone hatchets and other similar instruments. ne implements, though no longer used in Guiana, are to be found in ter or less abundance throughout the district.

At last, after four days' stay, we got off. The two or three people from Euwara-manakaru who came with us gave their wives knotted strings or quippus, each knot representing one of the days they expected to be away; so that the whole string formed a calendar to be used by the wives until the return of their husbands.

On going down to Yarewah on the Takutu, we found the two canoes which we had engaged, and from there we once more started on a river journey. But now, instead of being on a river of the Essequibo system, we were descending the watershed of the Amazon. The Takutu runs into the Rio Branco, that into the Rio Negro, and that into the Amazon, at Manaos. From Yarewah the boundary between the Brazilian and British territories passes along the Takutu, until that river is joined by the Cotinga, which flows in from the north, and up which the boundary line passes. This is the line laid down by the boundary commission under Sir Richard Schomburgk about 1840, and is really accepted by both nations, in spite of the vague claims which, as I have said, have been advanced by the Brazilians to the land between the Takutu and the Rupununi. The commandant of S. Joaquim, an educated Brazilian gentleman, and the chief resident official on that frontier, in his conversation fully recognised the boundary line thus described. I have been led to say so much on this subject because this part of the boundary is generally wrongly laid down in even the standard English atlases; and it is much to be desired that this, as well as the boundary line between British Guiana and Venezuela, should be more correctly represented.

We paddled gently down the Takutu, which is a river of considerable size, getting an occasional shot at one of the many turtles which lay basking in the sun on the logs at the river-side, or at an ibis as it fed on one of the innumerable ridges of sand. The journey led us, for two days, past the mouth of the Ireng and Cotinga rivers; past many flocks of beautiful rosy spoonbills; past porpoises, which our men said were omars, or water-women, and had frocks; past manatees, which venture up the Amazon rivers even as far as this; past ugly green guanas climbing on the trees on shore; past high cliff-like banks capped with long lines of white lilies (Hippeastrum), well defined against the sky; and past long reaches of bush-covered banks densely matted with wreaths of passion-flowers, at that time heavily loaded with large purple blooms. By the third day the river had become considerably wider, and the Rio Branco appeared before us, the Takutu running into it almost at right angles. On the left, in the angle formed by the junction of the two rivers, the high bank was crowned by a little stone fort. It was S. Joaquim, and our destination.

This fort was built more than a century ago by the Portuguese. It consists merely of a two-roomed house, under which is a lock-up, a rampart surrounding the whole. When Schomburgk visited the place about 1840, he found a Jesuit mission with a chapel and a few houses. But these have now disappeared, and the fort and the range of low huts, serving as soldiers' quarters, alone remain. For many years past it has barely been kept in repair, and, as it is now perfectly useless as a military station, the Brazilian authorities intend to abandon it. It is certainly quite time; the gates are never shut—indeed, only one of them is left; no sentinel paces the ramparts, no bugle ever sounds.

The nearest settlement of white men is many days' journey away; and the only communication with the outer world is by the boats which occasionally come up the Rio Negro to fetch cattle produced on the farms which surround the fort.

The cattle on these farms are left almost entirely to nature. The farms were established about the end of the last century, but were again destroyed, the cattle being dispersed over the Savannah during revolutionary times. When the farms were again re-established, the cattle, which had in the meantime greatly multiplied, were not all again gathered together; the greater number were allowed to roam and breed where they pleased. Once a year a certain number of the younger of these wild cattle are driven into the strongly stockaded pen which forms the central point of each of the gigantic farms into which these savannahs are divided. These impounded cattle, after being branded, are let out every day, but are driven back into the pen at night. Every now and then a large number of them are taken down the Rio Branco to Manaos, the nearest Brazilian town, and are from there distributed along the Amazon. Much of the cattle is also slaughtered on the farms; the meat, after being cut into thin slices, is slightly salted, and dried in the sun, and is then carried down to the Amazon and there sold.

At the central farm of the district resides a Government official, who is responsible for all the cattle in his district. His only assistants are a very few cowherds, a few of whom are Brazilians of a low class, a few are half-bred between Brazilians and Indians, but by far the greater number are the Indians of the district. Most of the work of these herdsmen is done from the back of small but strong horses, which, when not in use, roam all but free on the Savannah. All the food required is produced on the spot. For meat the men are allowed to kill a certain number of cattle for their own use, and the milk, which, however, as always in the case of any but thoroughly domesticated cattle, is very small in quantity, is at their disposal. Game, especially deer, is abundant. Cassava is grown at the principal farms, where it is made into farina, a coarse but most excellent and nutritive flour, which is distributed twice a month to the men of all the farms. Vegetables, such as yams, potatoes, and plantains, and fruits are but little grown, except in the fields of the Indians, where, however, they flourish so well that they might evidently be cultivated with advantage elsewhere.

After spending a very pleasant time at San Joaquim, we turned homeward. Calling on our way at one of the farms, we were able to purchase an ox for three-quarters of a pound of gunpowder. About four hundred head of cattle were driven into the pen, and from these we selected an animal.

For many days it had rained incessantly, and as we were generally without shelter by day or night, we were most anxious to get back to Quatata as quickly as possible. Travelling once more up the Takutu we reached the mouth of the Ireng or Mahoo River, and turned up this, purposing to force our way home up the Pirara, a small river, then much swollen by rains, which rises not far from Quatata, and runs into the Ireng about one day's journey above the point at which that river joins the Takutu.

The water in the Pirara had risen above the low banks, and the narrow belt of trees which generally separates the river from the Savannah now rose from the flood. As there was, therefore, little current, we advanced rapidly. At noon on the day on which we entered the river we reached a point which, according to the Indians, was the highest to which a canoe could at the time pass. It afterward appeared that we might have kept to the river much longer; but, believing the Indians, we disembarked, and walked the rest of the journey. Our way led across the bed of Lake Amuku. This, as I have said, is usually dry; but now we found that the water was out, and that for once the lake was a lake. For long distances we had to wade through water up to our waists, and often up to our necks. I was much struck by the way in which the Indians managed to follow the path, which, even when there is no water, is hardly discernible to an unpractised eye, and which now was completely hidden under a sheet of water; yet we emerged from the flood exactly where the track led out. But before this, when we came to the deepest part of the flood, the Indians became frightened, as they generally are in water, though they can swim like fishes; it was hard work to persuade them to advance. At last we came to higher and therefore dry ground, and after a twelve miles' walk came to Quatata.

June came, and it was quite time to be thinking of returning to Georgetown; but at first it seemed almost impossible to get Indians or to get possession of our canoes. The Indians were very unwilling to go with us, partly because food was still so scarce that we could expect only scanty rations on the journey, and partly, as they said, because a party of English soldiers were on their way up from Georgetown to capture and press Indians as soldiers. The same rumour has been heard by nearly every traveller in the interior; it is probably due to a half-remembered tradition of the slave-hunting expeditions which the Brazilians, as lately as forty years ago, used frequently to make among these people; and also to the tradition of the visit of English soldiers to Pirara in 1840. Whatever the origin of the rumour, it is a constant excuse used by the Indians when they are unwilling to undertake the fatigue of a journey. The other difficulty which delayed our immediate return to the coast was that some strange Indians had carried off my canoe from the waterside. Indians have a large, but occasionally inconvenient code of hospitality. An Indian thinks nothing of walking into the house of any other Indian of the same tribe and appropriating the food which may be in it; nor do the owners in any way resent this. In the same way, when an Indian, in his frequent wandering, finds a canoe in a convenient spot he takes it and leaves it wherever his own journey happens to end; rumour, passed from Indian to Indian, at last tells the owner of the craft as to the whereabouts of his property, and if he wants it he must fetch it back himself, or must wait till some other chance Indian, travelling, brings it back into the neighbourhood from which it was taken. In this way my canoe was out of reach just when I most wanted it, and the Indians who had removed it were surprised by my objecting to this conduct. However, at last we were ready to start. Moreover, very severe ophthalmia had broken out among the Indians, and had attacked my two companions; this was a further reason for speedy departure.

The Indians of Quatata carried all our goods down to the river side, and though this work occupied two days, they wanted no payment. At Pirara landing all but those of our own crews said good-bye to us.

It was in the very middle of the long rainy season, so that the currents in the river swept us down very rapidly. At night it was often very difficult to find dry ground on which to camp, and even when in the evening we slung our hammocks over dry land we sometimes found ourselves over water when we awoke in the morning, so rapidly was the water still rising. The creepers which festooned the trees on the banks were in most brilliant and full flower. It was one of the rare occasions on which I saw anything of that splendour of flower which dwellers in colder climates sometimes suppose to be characteristic of and universal in the tropics.

We soon reached the Rappoo, and below that had to maintain an almost constant struggle with falls. Every morning the Indians rubbed red peppers or lime-juice into their eyes to keep them awake, as they explained, in the falls. Once when neither limes nor peppers were at hand, rather than omit this self-torture, they soaked pieces of their blue cloth laps, and squeezed the indigo dye into the eyes. When this was done they were ready to shoot the falls.

During the high rains the falls are very difficult to pass, and long reaches of the river are transformed into vast rapids, through which the Indians steer their canoes with perfectly marvellous skill. Shooting a big fall, or running down a rapid of any size, is certainly exciting work. The canoe floats in smooth water at the top, and from there the bowman and steersman examine the fall and agree as to the particular course to be taken; this once decided, the rush begins. Suddenly the canoe, caught by the eddying, rushing water, bounds forward; it perhaps rushes straight towards some threatening sunken rock, but one strong, swift turn of the bowman's paddle saves it from that danger; it rushes on again, turned here and there by waves and contrary currents, the bowman and steersman contriving to guide it, until in its headlong rush it in some way reaches smooth water at the bottom.

It is difficult to find words to convey a picture of such a rapid or flood to one who has never seen any of the great rivers of South America. It is no ordinary river falling down a step of rocks, but a great and wide sea of contending waves and currents, surging and breaking in most chaotic confusion in, over, and round countless rocks and obstructions.

Sometimes, however, as happened to us on this occasion at Etannime, the main fall is too high and too rough to make it safe to shoot it. There are generally side channels, called itabors, to all these falls, and Etannime was no exception, so we made up our minds to lower the canoes down one of these. A rope was fastened to the bow of the canoe, and some of the men, standing on the bank, firmly held the other end of this. Then the canoe was allowed to glide stern foremost down into the narrow, rushing channel. This is a rapid of some two miles in length, but hardly ten yards in width, down which the water rushes fast and foaming, in and out among thick, overhanging trees, and round corners, and down low, but abrupt falls. As soon as, by slow paying out of the bow line, the canoe had been safely lowered down the first of the short reaches, those who were on board kept her in position by holding fast to the overhanging tree-trunks and branches, while those on shore dropped the rope, and then hurried through the bush to a point commanding the next reach, down which, as soon as they had again grasped the rope, the canoe was allowed to drift. In this way most of the reaches were passed, but sometimes the course of the channel was so crooked and rocky that it was impossible to pay out the rope from the shore. In these latter cases all got into the canoe, which was then allowed to hurry down the turning rapid, and was fended from the rocky banks as well as might be with poles, and much grasping of overhanging trees. So we got to the bottom of Etannime Falls. It was very tedious work, but far safer than shooting the main fall.

At last all the adventures of the expedition were over, and we reached Georgetown after an absence of six months from the civilised world.

The following discussion took place:—

Sir Henry Barkly said a good many years had elapsed since he was in Guiana, but the very interesting account which Mr. im Thurn had given of his travels in the interior of that country had awakened reminiscences of many happy days which he himself had spent in British, Dutch, and French Guiana, and had vividly recalled to his mind the impressions made upon him by the beauty of the scenery, the pleasantness of the climate, and the wonders of the vegetation. There were, however, as had been mentioned in the paper, drawbacks; consisting principally, so far as he was concerned, of the immense number of insects, but in Mr. im Thurn's case it appeared there was a want of bread, in consequence of the exceptionally dry season. He himself was abundantly supplied by the Indians with cassava, and with fish and game fared sumptuously. He was glad to learn that the colonists were doing more than they used to do for the study of natural science; that they had established something like a museum, and were willing to contribute towards the expenses of such a journey into the interior as that of Mr. im Thurn. In his day, all that they seemed to think about was sugar and coffee. When his predecessor, Sir Henry Light asked for a vote in support of the explorations of Sir Robert Schomburgk, it was opposed on the ground that there was nothing in the interior besides bush and water. Mr. im Thurn had alluded to the very curious picture writings to be found on the rocks near almost all the rivers in Guiana, and he believed near many other rivers in South America. No satisfactory explanation had yet been given of the origin of those writings, or of the people who wrote them. Humboldt had a paper on the subject, but did not appear to throw any great light upon it. His theory was that the writings were the work of the ancestors of the present inhabitants, the Caribs; but the present inhabitants had not the slightest idea of the origin of the writings, and had no superstitious feelings with regard to them. On the Corentyn River, he (Sir H. Barkly) was told by a Carib chief, that the writings were made by the Great Spirit, who stretched out his foot from the heavens and wrote them with his great toe on the rocks. The chief, however, did not appear to pay any respect to that theory; and he would like to ask Mr. im Thurn if the Indians with whom he travelled had any feeling of veneration for the writings, and whether he had made any copies of them in order to assist in tracing the race by whom they were executed —a race which at one time extended over the greater part of North and South America. It was well known that the *Victoria regia*, which could now be seen at Kew, was to be found at one time covering many acres in the lagoons on the banks of the Essequibo, at no great distance above the Aretaka Falls. He had seen it himself, and some few travellers went out from England on purpose to see it. He had been told that in a subsequent dry season the plants had perished, and he would like to know whether they had sprung up again, or whether it was necessary to go above the Christmas Cataracts of the Berbice River in order to see them. As far as he could judge, the paper gave a very true and accurate description of the interior of Guiana.

Mr. IM THURN said that Humboldt's account of the picture rocks, to which Sir Henry Barkly had alluded, was not very satisfactory, but that traveller had done more to elucidate the subject than anybody else. It was quite true that similar drawings were found in other parts, such as St. Thomas, St. Vincent, and Dominica. He hardly thought they were made by Caribs, because the Caribs, he believed, reached Guiana at a very much later period than that to which the drawings must be referred, and they probably did not reach even the islands till after the execution of these drawings. However, that was a point about which little was known. As to any feeling of veneration entertained by the Indians for these pictures, whenever they came to a high cliff or mountain on which there were these drawings, the Indians rubbed red peppers into their eyes, to avert the ill-will of the spirits who were supposed to reside in the rocks. During one of his short expeditions he had the drawings at Waraputa photographed, and he had deposited copies in the Library of the Geographical Society. He had made sketches of other rock pictures, of which he hoped to make further use some day. The spot to which Sir Henry Barkly had referred in connection with the *Victoria regia* was a sort of lagoon on Glück Island, about a day's journey above the first falls on the Essequibo, perhaps 80 miles from the mouth. It was a well-known place, and had been frequently visited. In November 1878, on his way up to the Kaieteur Falls, he stopped there purposely to see the water-lily. It was at the end of a most extraordinarily dry season. The pond was quite dry, and the lily had disappeared, except at the further end, where there were one or two small seedling plants. He had never been to the spot since, but he had very little doubt that the plant had grown again, because during that same year it disappeared from the spots where it had been planted in the neighbourhood of Georgetown, and with the following wet season the young plants sprang up again, the waters there being now covered as thickly as ever with the *Victoria regia*. Probably the same thing had taken place on Glück Island.

Mr. Flint said he accompanied Mr. im Thurn on the expedition which had formed the subject of his paper, but having on a previous occasion made a journey in another direction to the extraordinary mountain in the interior, Mount Roraima, he thought the Meeting would like to hear some observations on that subject. Roraima is situated in the western corner of British Guiana, on the borders of Brazil and Venezuela, in lat. 5° 9′ 40″ N., long. 60° 48″ W. Sir Robert Schomburgk visited this district in 1838, when he defined the boundary for the Government between these countries, making the line pass right across the mountain, half thus remaining in Venezuelan territory and half in British. Roraima is a duplex mountain, two large plateaus or blocks of sandstone standing side by side on one large mound. From the northernmost block comes the River Kukenam, which rolls down the bare face of the rock, making a magnificent cascade of over 1500 feet: Schomburgk calls this half of the mountain Kukenam and the other Roraima, but frequent conversations with the Indians in the immediate neighbourhood proved to him (Mr. Flint) that the one name, Roraima, was used for both. In July 1877, with his friend G. Eddington, he left Karenacru, where they were then staying, to try and see if there was any way of ascending this mountain, no one as yet having even tried to reach the top. Taking with them eight Macusi Indians, two Aracoonahs, the Carib chief Cephas and his son as interpreters, they started. They made their head-quarters at the village of "Toorooie," after a walk which occupied, including halts, sixteen days. Here they found an old Indian chief who remembered Schomburgk's visit, and undertook to provide them with guides, at the same time trying all he could to dissuade them from the ascent, as their presumption would be sure to enrage the spirits of the mountains. The two guides asked exorbitant wages, but a bargain was eventually struck, and they walked along the southern face of the mountain until they came to the western end of the first block, passing several streams on their way, all of which had their rise on the summit. The names of the principal are Arapoopooh, the Hokkoi, and the Cowar, near to which last-named stream they thought they saw a cleft in the precipitous walls of the mountain which seemed to offer some hope of ascending; they therefore climbed up some grass-covered slopes till they reached the belt of dense bush that encircles the cliff, and, building a banùboo or shed of leaves, stayed there for the night. From this position they had a splendid view of the other block, with the Kukenam pouring over the top, then becoming lost to sight in the thick bush, to emerge again a mile or two further on as a fine river meandering through the grassy undulating land of Venezuela. The noise was deafening. They were close to the Cowar, which is a considerable fall, but does not fall in the same perpendicular manner as the Kukenam, it having worn for itself a slanting bed half-way down the face of the rock. In the morning, at six o'clock, they started to cut their way up through the dense vegetation. At one o'clock P.M. they reached the foot of the cliff, and were enveloped in a thick cloud, which presently clearing away opened to them a magnificent view over the borders of Brazil and Venezuela, the landscape being bathed in most glorious sunshine. The immense block of sandstone towering high above seemed to overhang them, in fact the position was not very safe, as pieces of stone freshly broken lay scattered about, evidently having fallen from the upper parts of the mountain, for the Indians afterwards showed them in the valley below some huge masses that they said had come crashing down during a thunderstorm. The cleft in the rock proved to be nothing more than discoloration, which at a distance gave an idea of depth; water was slowly trickling down, which doubtless caused this appearance. Finding this spot utterly impracticable they tried in vain to induce the Indians to help in cutting a path through the bush along the mountain base to the Cowar or beyond. From their position close to the vertical walls of the mountain no place in the immediate vicinity was visible which held out hopes of ascending, but on the way back they saw two places that appeared extremely promising. The Indians could not be persuaded to accompany them the next day to these places. He had no doubt that some future traveller, taking negroes instead of Indians, would succeed in ascending the mountain, although Mr. Barrington Brown and Mr. Boddam Whetham had both pronounced it inaccessible except by means of a balloon. Neither of these two gentlemen had, however, approached nearer than three miles from the cliff. One of the chief difficulties in the way of travellers in these elevated districts is the almost entire absence of animal life. A few birds only were to be got, and small fish like gudgeon which the Indians catch in traps and nets. On their return journey they passed through Brazilian territory, a well-watered mountainous country, in which some of the smaller hills were found to be composed of red jasper (hornstone), which the Indians use in the place of flint for procuring fire; for tinder they use either dried cotton or a kind of spongy composition in which the coushi ants place their larvæ, this with great difficulty they dig out of the nests, getting horribly bitten during the process. In the beds of some of the streams which passed through some strata of this jasper he noticed that large rectangular blocks were fitted closely together forming regular terraces or steps as if fashioned by the hand of some skilful mason. The party were twenty-two days in reaching Karenacru, having been nine days at the villages of "Toorooie" and "Manoopotahpooh," making in all forty-seven days.

Kuldja. By Major F. C. H. Clarke, C.M.G., B.A., F.R.G.S., and Member of the Imperial Russian Geographical Society.

Map, p. 528.

Perhaps there is no district in Central Asia which has played so prominent a part in the history of the East as that of Kuldja. Situated at the north-west corner of the vast central plateau, at the only point where this plateau is accessible, the great highway of the Kuldja Oasis has served as a resting place for those vast hordes, whose migrations, conquests, and defeats, spread over centuries, form an important chapter in the world's history.

To enter into any details of the vicissitudes through which Kuldja has passed would be manifestly impossible in the space allotted to us. Sufficient for our present purpose will be a slight retrospective sketch of the relations of China with this border country, so far as to throw light on contemporary events and on the varied races by which it is peopled.

Historical Sketch.—The relations of the Chinese with Central Asia commenced at a very remote epoch. The first written evidence dates back to the second century B.C., when Chan-tsian, during the empire of Wu-di of the Han dynasty, undertook a journey to Central Asia and opened relations with the "Western Country," by which name the districts abutting on the Tien-shan were known to the Chinese. Annexations followed, and in the year 59 B.C. all the country lying on the northern and southern slopes of that range acknowledged the suzerainty of China. This sway, disputed at times by the Huns, was little more than nominal for some centuries, until the second emperor of the Tang dynasty, A.D. 627, despatched an army to the country for the purpose of enforcing the allegiance of the petty princes who had been endeavouring to cast off the Chinese yoke.

According to the researches of Abel Rémusat, Grigorief, and other orientalists, the Western Country was peopled at this time by the Uigurs,* a Turkish tribe, which at a much earlier date had descended from the north and occupied the slopes of the eastern Tien-shan. The Chinese proceeded to consolidate their possessions and divided the Western Country into departments (*fu*) and districts (*chow*), the whole being placed under the administration of a viceroy, with his seat of government at Kucha. Then followed a period during which the Chinese power in Central Asia steadily declined, and the Western Country fell in succession under the domination of Tibetan tribes, of the Arabs, who spread Islam far and wide, of Turkish tribes, of the Mongol tribe of Kara-kitai, and of Chingiz Khan.

During the supremacy of the descendants of Chingiz Khan, Dzungaria, of which Kuldja constituted a part, was the camping ground of three Kalmuk tribes, which subsequently formed a powerful confederation, whence their name of *Oirats.* In the seventeenth and part of the eighteenth century the Kalmuk sovereignty extended from the Altai to Tibet, but in the middle of the latter century the Chinese reconquered the country, putting to death or driving away the Kalmuk population. Dzungaria ceased thenceforth to be the empire of the Kalmuks. It became once more a Chinese province, and was divided into seven districts, of which the viceroyalty of Ili consisted of three: Tarbagatai, Kurkara-usu, and Ili, or Kuldja. The Chinese then proceeded to repeople the country with military colonies from Manchuria, recruited chiefly among the Solons, Daours, and Siboes, and with Mahomedan settlers from Eastern Turkistan, who became known as Taranchis, or "agriculturists"; they also caused the Chinese Mahomedans—the Dungans *—of their western provinces to emigrate into Dzungaria. In 1771 the Kalmuks, who had been fugitives with their compatriots on the Volga, commenced to return.

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* Of all the Uralo-Altaic race, the Uigurs (called by the Chinese the *Hoei-hu*) were probably the most civilised. They had a history, a literature, and a peculiar written character, which they had acquired from the Buddhist missionaries. Later on, the Nestorian Christian missionaries taught them the Syriac alphabet, a modification of which is known as the Uigur, and, although no longer in use, gave birth to the Mongol, Kalmuk, and Manchu alphabets. Christianity would appear to have reached Central Asia and China about the fifth century of our era.

Although for many years latent disaffection had been rife among the Mahomedan population, Dzungaria remained to the Chinese until 1862, when the rebellion of the Dungans in the neighbouring provinces of Shen-si and Kan-su spread to Kuldja, where the Taranchis united with their co-religionists to throw off the Chinese yoke. The revolt was so far successful inasmuch as the Chinese rule was overthrown, but so great were the disorders which ensued between the two Mahomedan factions in their struggle for supreme power, that an opportunity was offered for the intervention of the Russians, who occupied the country in 1871.

Mr. Schuyler, in his work on Turkistan, expresses the belief that the occupation of Kuldja by the Russians was probably brought about as much by apprehension that Yakub Beg, of Kashgar, intended to conquer it, as from any fear of the wave of disorder being communicated to the Russian provinces. At the time of their occupation the Russian Government assured the Court of Peking that it was merely their intention to take over the temporary administration of the country until such time as the Chinese felt themselves strong enough to resume possession. It would now, however, appear that the recent negotiations opened by China at the Court of St. Petersburg for the restoration of the province have proved abortive, the conditions attached by the Russians to the retrocession being so onerous as to render them inacceptable at Peking.

Without trenching on the domain of politics, it may be stated that the main point at issue between the two Governments is that the Russians, by retaining in their possession that part of the province which lies to the south of the Ili—that is to say, the Tien-shan and its passes—would entirely control the main lines of communication in that region, and would hold a commanding position for offence and defence in North-West China. Another important military consideration is that the Power which possesses the passes over the Tien-shan, has at the same time control over the Kirghiz inhabitants, upon whose herds the transport through these regions is entirely dependent.

Geography.—Let us now turn to a consideration of the geography of the country, and at the same time pay a tribute to the unwearied industry of the Russian explorers and travellers, Semenof, Fedchenko, Prejevalsky, Kuropatkin, Maief, Aristof, Kaulbars, Severtsof, Mushketof, and many others, who have thrown so much light on the geography of these little-known regions.*

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* Probably the Argons of Marco Polo.—Yule's 'Marco Polo.'

The province of Kuldja occupies an area of some 25,000 square miles. In shape it is in the form of a triangle which projects from the south-east corner of Semirechia, the base abutting on the latter province, and the apex, where the river Ili has its sources, lying towards the east. The sides of the triangle are formed of high mountain ranges, of which the range on the south—the Tien-shan, or Celestial Mountains—is one of the loftiest in Central Asia. The ridge on the north side belongs to the Dzungaria Ala-tagh system, and is less elevated. The base of the triangle is open, the Semirechian frontier on this side being for the most part marked by a river, the Borohudsir.

A glance at the map will show how great is the importance of this district to China, as, were it allowed to fall into the hands of another Power, all direct communication would be intercepted between the Chinese possessions to the south (Kashgar) and those to the north, of the triangle (Chuguchak).

Orography.—It has been mentioned that the south side of the triangle is formed by the Tien-shan, a majestic ridge, rising to an absolute height of 15,000 to 16,000 feet, covered with a dazzling continuous mantle of snow, the sky-line being broken by an endless succession of giant peaks, some upwards of 20,000 feet above the level of the sea. In the lofty group of Khan-tengri (21,000 feet), the eternal snows † feed glaciers of great breadth, while in the sources of the Sharyar River M. Semenof discovered a glacial sea exceeding in dimensions the well-known Mer-de-glace of the Valley of Chamounix.

A little to the west of Khan-tengri a ridge strikes away from the Tien-shan, called the Chikilik and Uzun-tagh, separating the fertile valleys of the Tekess and Ili, while, considerably to the east of Khan-tengri, the Narat Mountains form the northern buttress of an extensive and lofty plateau situated in the very heart of the Tien-shan, and known as the Great and Little Yulduz (star, *Turk.*). The Narat Mountains never reach the limits of perpetual snow, but, nevertheless, they present a wild and Alpine character. Another branch of the Narat, of no great elevation (pass 6000 feet), separates the valleys of the Kungess and Tsanma.

The continuous range forming the northern border of Kuldja belongs, as has been mentioned, to the Dzungaria Ala-tagh system, and is known on the latest Russian maps as the Borokhoro Mountains. To the north of the ridge lies the lake of Sairam, embosomed in the mountains, while the southern slope is furrowed by numerous streams—the right affluents of the Ili. The spurs on this side fall in gentle slopes to the River Ili, but towards the east of the range develop into narrow chains, e. g. the Avral Mountains, which separate the basins of the Kash and Kungess.

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* The latest Russian botanical explorers in Chinese territory—Messrs. Regel and Fetisof—do not, however, appear to have been very cordially received by the Chinese, who, in fact, peremptorily ordered them to withdraw, but not until after the botanists had made important communications to their Government as to the position and strength of the Chinese forces on the Kuldja frontier.

† The existence of eternal snows and glaciers led to the range west of Khan-tengri being called Mus-tagh (*mus* in Tartar meaning ice). According to some writers, from this word *mus* was derived the old name *Imaus.*

Rivers.—The chief river of the Kuldja district, the Ili, is formed by two rivers, the Tekess and Kungess, the junction of which lies between 30 and 40 miles above Taranchi Kuldja. The Tekess is the larger of the two streams. It takes its rise in the northern slopes of the Tien-shan, about 75 miles to the west of Urten Muzart, and at a height of 11,600 feet above the sea-level. It flows at first N.N.E., through wild mountain gorges, but on issuing into the plain at the foot of the Tien-shan turns east, and receives numerous affluents from both banks, amongst which, on the right, are the rivers Uch-kapkak, Karakol, and Muzart, which is remarkable for its pass in the Tien-shan. Of the affluents on the left bank it is said that all have convenient tracks leading to the Ili, of which perhaps that along the Su-ashu, the only river which does not lose itself in the desert but reaches the Ili, is the most convenient. From the mouth of one of its tributaries from the right, the Mointa, the Tekess turns north-east, and bursts through the northern spurs of the Tien-shan in a narrow tortuous defile.* On being joined by the Jurgalan it bends north, and further on, after receiving the other important tributary, the Kungess, it turns west, nearly at right angles to its previous course, takes the name of the Ili, and bathes the walls of Kuldja with a very swift stream. Pursuing this westerly course it traverses a broad plain, and ultimately disembogues into Lake Balkhash, 400 miles below Kuldja. Its total course is not less than 750 miles. The banks of the river, particularly the right, are marshy and overgrown with reeds. When the river is full there are no fords and the banks are frequently submerged, but at other seasons the river is fordable at Kuldja. At one time the Russians entertained hopes of establishing steamer communication from Lake Balkhash up the Ili, as the river is navigable for 50 miles above Kuldja, but nothing has practically been done.

The Kungess takes its rise about 170 miles to the east of Kuldja in the main range of the Tien-shan near the Narat Pass. Its broad fertile valley has been from time immemorial a favourite haunt of the nomads; it is, moreover, of importance as the direct and comparatively easy route of communication between Kuldja and Karashaar. The entire length of the river exceeds 120 miles.

The Kash, or properly Kass, is the principal affluent of the Ili on the right bank. It takes its rise about 160 miles to the east of Kuldja in the Urukti-tagh, the eastern continuation of the Borokhoro, and joins the Ili about 40 miles east of Kuldja. Its course is almost parallel with that of the Kungess, from which it is separated by the Avral-tagh. The valley of the river is of importance to the Taranchis who till the fertile lands on its borders, while from it, through the agency of a connecting canal, the inhabitants of Kuldja derive their chief supply of drinking water.

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* Along the defile is a road practicable for pack-animals only when the water is low, as the river has to be crossed and recrossed frequently.

The valleys of the Kungess, Tekess, and Kash present a luxuriance of vegetation, as does the Ili to the point where it is swollen by the Kash. The banks of the river still remain cultivated as far as Koldjiher, after which the Steppe commences and extends uninterruptedly into Semirechia.

The Borohudsir, with its valley and neighbouring mountain district, belongs also to the basin of the Ili, although its waters never reach that river. It takes its rise about 2½ miles above the Borohudsir Fort, and its total length is 30 miles. About two miles before it reaches the Ili it loses itself in a dense reed-grown marsh. The valley on either side abounds in excellent pastures. The Borohudsir formed the old frontier between Russia and Western China before the occupation of Kuldja by the Russians.

*Communications.**—With regard to the roads of this region, the main artery of communication is the great Chinese carriage-road which leads from Nanking by way of Hankow, Ngan-si-chow, and Hami, to Turfan. At the latter town it bifurcates; one branch striking through Urumtsi, Manass, Chuguchak, to Semipalatinsk (with a branch over the Talki Pass to Kuldja) along the northern margin of Kuldja, the other branch proceeding by way of Karashaar, Korla, Kucha, Ak-su to Kashgar, skirting the southern border of the province. This latter branch passes through a succession of fertile oases which border the foot of the Tien-shan.

The road running parallel to the Tien-shan on the south receives a mass of bridle paths which traverse the Tien-shan, Pamir, and Kuen-lun. The chief of these are:—

(1) A path from the town of Korla by the valleys of the Yulduz and Kungess to the town of Kuldja. This road, which was the one taken by Prejevalsky in his journey to Lob-nor, is 350 miles in length. The highest passes are the Habtsagai-gol (9360 feet) and the Narat (9800 feet). Besides the Narat Pass, there are two other passes to the west of it—the Dagit and Jambil. The Tien-shan in this part of its range has no glaciers, and eternal snow lies only on isolated peaks. In winter these passes become impracticable owing to snow-drifts, but in summer they are perfectly suitable for camels.

(2) The bridle paths from the towns of Bai and Ak-su to the Muzart Pass, and thence to the town of Kuldja. The height of the pass has never been accurately determined, but it is probably upwards of

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* The subsequent information regarding the routes is taken chiefly from Colonel Kuropatkin's 'Kashgaria,' to which work the reader of Russian is referred for details.

12,000 feet. It is a difficult pass for pack-animals, especially on the south side of the Tien-shan, where the road winds over glaciers. From Bai to the pass is about 115 miles, thence to Kuldja about 200 miles. From Ak-su to the pass is about 93 miles. These two roads unite at the Muzart guard-house, which is 40 miles on the south side of the pass. On the summit is another guard-house, and below it a fort for 300 men. There is a third intermediate road, which leaves the Aksu-Bai road at Jurga, and also leads to the Muzart guard-house.

The Muzart Pass formed at one time the chief route of communication between the Ili province and Kashgar; but since the insurrection of the Dungans it has been little frequented, and, having been suffered to fall into decay, became unfit for traffic. Recent information, however, would appear to indicate that this defect has been remedied, and that free communication has now been restored.

(3) A bridle path from Ak-su to the town of Ush-turfan and thence over the Badal Pass (14,000 feet) to Fort Karakol. This road was traversed in 1877 by Captain Sunargulof. The distance from Ak-su to Ush-turfan is 54½ miles, thence to the Badal Pass 70 miles, and from the pass to the Russian settlement of Slivkino 84 miles. Thus the distance from Ak-su to Slivkino is about 208 miles. Slivkino is 22 miles from Karakol.

(4) There are several bridle paths leading from Kashgar to Fort Naryn. The most practicable of these lead through the Terekty (12,600 feet) and Turugart (12,760 feet) passes. From Kashgar to Fort Naryn by the first of these is 173 miles, by the second 180 miles. In Russian territory there is a carriage road as far as Fort Naryn; and the bridle path over the Tash-rabat Pass to Lake Chatir and thence over the Turugart Pass to Fort Chakmak and Kashgar could, with very little labour, be made into a road fit for carts. Colonel Grünwald, who explored these two passes, Turugart and Terekty, in 1878, says that the former is the least difficult, but that either could easily be made into carriageable roads.

Mention has been already made of the road from Urumtsi to Kuldja over the Talki Pass in the Borokhoro. The Talki defile is of gentle slope, but very winding; the river is bridged no less than twenty-six times. After crossing the pass, the road skirts Lake Sairam and bends away to the eastward, passing by Jinho and Manass to Urumtsi and Turfan. This road is fit for carts, but is very circuitous in comparison with the more direct road up the Kungess Valley. There are other passes in the Borokhoro Range to the east of Talki, but they are all more or less difficult; the least so is the Pass of Penjin or Pelichin.

Lastly, Kuldja is connected with the great Siberian post-road (and thence with all parts of Russian Turkistan) by a carriage road through Borohudsir and the Altyn-imel Pass. The whole route is perfectly practicable for wheel transport; difficulties are alone met with at the passages of the rivers, and in some marshy and sandy places, such as occur on the River Ussek.

Towns.—With regard to the towns in the Kuldja district, there are but five, viz. Kuldja, the three Dungan towns of Suidun, Tarji, and Chin-cha-ho-dzi, and the Chinese town of Lu-tsu-gun. There are two towns of the name of Kuldja,[*] 25 miles apart; one the old Taranchi town, now the Russian head-quarters, and the other Manchu Kuldja, which before the rebellion was a flourishing town of 75,000 inhabitants, but is now a ruin. Under the Chinese domination, it was an important emporium for commerce.

All the other settlements in the district are simply agricultural villages.

Population.—The population of the Kuldja district is very varied. There are six chief nationalities: Taranchis, Dungans, Siboes (or Sebes), Torguts, Kalmuks, and Kirghiz. The first three are sedentary, the rest nomad. The Taranchis, Dungans, and Kirghiz are Moslems, the others are Buddhists. Besides the foregoing, there are Chinese, Solons, Daours, Manchus, Sarts, and others.

The Taranchis, a race derived from a union of Turko-Tartar with Aryan blood, were brought into the country by the Chinese from Eastern Turkistan, with the object of making them tillers of the soil. They constitute the bulk of the population, and are located chiefly on the right bank of the Ili, up-stream from Kuldja, and on the Kash. The rebellion never affected this part, but was confined to the district below Kuldja. The Taranchis speak a dialect of Jagatai or Oriental Turk, and are strict Moslems.

The Dungans are generally held to be descendants of the ancient Uigurs, who colonised these districts from very early times. From long subjection to the Chinese, they adopted their language, customs, and manners, taking unto themselves Chinese wives. They have always, however, remained firm adherents of Islam. They are less numerous than the Taranchis, and live on the right bank of the Ili, between Kuldja and Mazar.

The third sedentary nationality in the province are the Siboes or Sebes. They are the result of the union of Chinese with Kalmuk women, and were located here by the Chinese as military settlers. They live chiefly on the left bank of the Ili.

Of the Torguts and Kalmuks, the former are chiefly found in the valley of the Kungess and outside the district round Karashaar. They possess large flocks and an excellent breed of horses; they form the light cavalry of the Chinese. The Kalmuks present the true Mongol type, and are supposed to be the descendants of the Dzungarians; they nomadise in the valleys of the Tekess, Kungess, and Kash. They are

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[*] A word of Mongol or Manchu origin, signifying "mountain goat."

Buddhists, and cordially detest the Moslem inhabitants of the district, by whom they were nearly exterminated during the Dungan rebellion.

In the upper Ili valley, on the slopes of the Borokhoro, and in the mountains separating the valleys of the Tekess and Ili, lie the nomad haunts of several Kirghiz tribes of Turko-Tartar origin. Besides these, some Kara-Kirghiz (Buruts) tribes come in summer from Semirechia to pasture their flocks on the upper Tekess; they have a great resemblance to the Kalmuks, but speak a dialect of Jagatai.

The Solons and Daours are also of Mongol extraction, and were brought into the country by the Chinese as military colonists, but they are in small numbers. They are Buddhists.

Besides the foregoing, there are a few Chinese, Champans (Chinese convicts), Manchus, and Sarts. The Chinese form the merchant class in the towns, chiefly at Kuldja. The Sarts came from Tashkend, Khokand, and other places, and are traders; their origin is a matter of controversy, but there is little doubt that they are a mixture of Turkish with Aryan blood.

The total number of inhabitants in Kuldja may be tabulated as follows, but these figures, in the absence of a census, must only be considered approximate. Manchus and Sarts are not included.

		Total of Sedentary Population.
Taranchis	30,000 to 40,000	40,000 to 55,000
Dungans	6,000 „ 10,000	
Siboes and Chinese	4,000 „ 5,000	
		Total of Nomad Population.
Kirghiz	30,000 „ 35,000	65,000 to 75,000
Kalmuks	30,000	
Torguts	5,000 „ 10,000	
Total	105,000 to 130,000	

Before closing our sketch, a few words may be added on the climate and products of the district.

Climate.—The climate of Kuldja is less subject to great variations of temperature than might be expected from its position in the heart of Asia. It is temperate and healthy, but is subject to a continuous dry wind which blows from the arid shores of Lake Balkhash. The mean annual temperature is lower than in Tashkend. At Kuldja the mean annual temperature is 48·5° F., the mean temperature of summer 79·5° F., of winter 20·3° F. The coldest month is January, when the temperature averages 14·3° F.

The rainfall is very limited, and cultivation is entirely dependent on artificial irrigation. In its prosperous days the district was intersected by a network of canals, but owing to the succession of internecine struggles which devastated the country, these canals became neglected and in consequence dried up. What Kuropatkin said of Kashgaria is true here also: "Where the water reaches, there is life; where it ends, there is desert."

Vegetable Products.—With an equable climate and a fertility of soil not to be surpassed in Central Asia, the growth of the vegetable world is much favoured. Cereals of all kinds flourish and the district abounds in fruits and vegetables, including the apricot, apple, pear, and grape. Rice is grown in the low lands, and also cotton. The cotton is not so good as that of the Turfan district of China,[*] where this product used to form an important article of trade. At the present time the Government of West Siberia is engaged in elaborating projects for the development of the cotton-growing district of Turfan, in connection with their scheme for water communication by the Black Irtysh.

Minerals.—As regards the mineral products of Kuldja, they are numerous, but on the whole, except perhaps the coal, not valuable. It was thought at one time that gold-mining would become an industry and that Kuldja was destined to be the El Dorado of Central Asia, but these expectations do not appear to be any nearer realisation now than they were in the time of Peter the Great. M. Mushketof, the Russian Government geologist, who has been engaged for some time in mining explorations in Central Asia, reports that gold is found in small quantities in the auriferous sands of the basins of the Ili, the Tekess, and the Zerafshan.[†] In the Ili basin, gold is only found in its *right* affluents which issue from the sienitic-granite spurs of the Dzungaria Ala-tagh, whilst in the upper waters or *left* affluents, which abrade the schistose rocks of the Kara-tagh,[‡] there is no gold.

With regard to coal, this mineral is found distributed over considerable areas in Kuldja, but in M. Mushketof's opinion the coal measures of Urumtsi (in China) are much richer. In Kuldja coal, in beds varying in thickness from one to eight feet, is found in the basin of the Ili, of the Jerantai, an affluent of the Kash, and probably on the left side of the Kash valley in the Avral Mountains. It is also found on the south slopes of the Kara-tagh,[‡] in the Tekess basin. The same geologist remarks that the coal-bearing strata are almost entirely devoid of fossil remains, and he is of opinion, judging from the quality of the coal and the relations of the coal-bearing strata to the older formations, e.g. the mountain limestone, that the coal belongs to the Jurassic period.

Besides the foregoing minerals, copper, specular iron-ore, manganese (pyrolusite), gypsum, marble, sulphur, and graphite are found, but little appears to have been done for the practical development of mining industry—possibly on account of the unsettled future of the district.

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[*] The adjoining districts of Eastern Turkistan were renowned for their cotton and vineyards in Marco Polo's time (*see* Yule's 'Marco Polo').

[†] The name signifies "gold-bearing."

[‡] The local name for the mountains at the source of the Tekess.

At the same time it must be remarked that exploring parties of Russian officers, botanists and others, are being constantly heard of penetrating into China and Tibet, in the hope perhaps of finding the long-sought El Dorado further eastward.

M. Severtsof's Journey in Ferghana and the Pamir in 1877–8.*

The party which General von Kaufmann in 1877 directed to explore Ferghana and the Pamir, consisted of M. N. Severtsof, who, besides the general control of the expedition, paid especial attention to physical geography and zoology, M. Schwarz, director of the Tashkend Observatory, who determined astronomical positions and took magnetic observations, M. Skassy, as topographer, who in 1878 also undertook M. Schwarz's functions, and M. T. T. Skorniakof, as chief of the escort and assistant to M. Severtsof in his zoological, botanical, and geological researches. In the spring of 1878, Colonel Kushakewitch also joined the expedition as botanist and entomologist.

At the end of September 1877, the expedition started from Tashkend, and completing their preparations at Osh by October 17th, directed their course to the south through Gulcha,† and ascended the Alai on October 26th by the Shart Pass, which had not been previously explored. The general opinion hitherto had been that the Alai passes were inaccessible from the end of September till late in the spring, but M. Severtsof was enabled to prove the contrary, and thus confirm the view which he entertained from his previous experience in the Tien-shan in October 1867. On October 25th, indeed, the Shart Pass is stated to have been free from snow to a height of 13,000 feet, and no snow was seen on the neighbouring summits of the Alai.

At Sufi Kurgan, near Gulcha, there are four roads leading to the Alai passes, which further to the south and south-east unite into two. The first two lead to Kashgar through the passes of Terek (12,500 feet) and Shart (13,000 feet), and join close to the outpost of Irkeshtam, near the eastern Kizyl-su, one of the many sources of the Tarim. The second pair of roads lead through the Archat (11,500 feet) and Taldyk (11,800 feet) passes, and after uniting on the Alai at the western Kizyl-su, the northern head of the Amu-darya, lead through the Kizyl Yart gorge and passes (14,000 feet) to the Pamir. Kizyl Yart is the pass leading through the Trans-Alai Range to the Pamir, while at an angle to it is another road from Shart which was the one followed by

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* From a translation by M. Alexis Lomonossof, F.R.G.S., Assistant Secretary of the Imperial Russian Geographical Society.—This memoir is that alluded to in the present volume of the 'Proceedings,' p. 137.

† Some part of the route will be found on the map at p. 528; but the best map to refer to is that of Trotter, in 'Journal R. G. S.,' vol. xlviii. p. 173.

M. Severtsof.—On October 26th there was a heavy fall of snow, which, however, melted, and two days later the southern slopes of Kizyl Yart were free from snow. Although the season was so far advanced, M. Severtsof was here able to make a collection of sixteen species of migratory birds, wintering in the locality, among which were redwings (*Sylvia curruca*) common in European and Asiatic Russia. After making themselves acquainted with the general character of the northern Pamir between Kizyl Yart and Kara Kul, and having laid down on the map the unexplored upper portion of the Markhan-su, the affluent of the Kashgar-darya (eastern Kizyl-su), the expedition on November 1st retraced their steps to the Kizyl Yart defile and the junction of the roads from the Archat and Taldyk passes. During some fine clear weather they took astronomical observations, and also measured the peaks of the Trans-Alai Range. The highest to the west of Kizyl Yart is the Kaufmann Peak (22,800 feet), seen by M. Fedchenko, and to the east the three-peaked mountain Gurumdy, the western summit of which was found to be 20,300 feet high. Proceeding through the Taldyk Pass, the expedition were occupied during November in exploring the mountain ranges between the Kurshab and Tara rivers and the upper portion of the Kara-darya. The month of December was chiefly occupied by M. Severtsof in making zoological observations in the neighbourhood of Gulcha, Osh, and Andijan. Then, leaving M. Skorniakof to make collections of birds at Balyk Chach, at the junction of the Kara-darya and the Naryn, he went to Tashkend to present the preliminary report on his explorations to General von Kaufmann, and to obtain further instructions as to the work to be undertaken in 1878.

In the spring of 1878, the expedition, which was now accompanied by M. Kushakewitch as botanist, explored the Ferghana Valley and the mountains to the north and east. Owing to the unusual severity of the winter and spring, an early start for the Pamir was impossible; but in the middle of July the expedition advanced in several detachments, and assembled near the Kara Kul early in August, one of the chief objects of the journey being a series of levellings from the Ferghana Valley to Kara Kul. M. Skorniakof, meantime, proceeding through the Kara Kazyk Pass (14,000 feet), traversed the whole length of the Alai, where he made collections of much value, and determined the height of fifteen positions by boiling-point. On July 10th, the Kara Kazyk Pass was impenetrable from deep snow, though in most years, notwithstanding its great elevation, it is entirely free from snow during three months, from early in August to the beginning of October. M. Skassy began the levelling from Osh on July 17th, and on August 9th reached Kara Kul. MM. Severtsof and Kushakewitch with M. Rudnef—who was obliged to make surveys on the Pamir to enable M. Skassy to carry his levelling beyond Kara Kul—started from Osh on July 17th, and on the 27th reached the Alai through the Archat Pass

(10,300 feet). The journey was very difficult, owing to an unusually late high flood on the Kurshab, along which their route lay. Several of the bridges were carried away and the fords were impassable; in one place the members of the expedition were swept off the ford into deep water, and had considerable difficulty in reaching the bank without injury to their instruments and collections. On the Alai, MM. Severtsof and Kushakewitch separated, the former devoting the early part of August to the exploration of the upper portion of the Kashgar-darya (eastern Kizyl-su), while the latter and M. Rudnef proceeded to Kara Kul, and occupied themselves, the one with botanising, and the other with completing his surveys begun in 1876. After making himself thoroughly acquainted with the summer condition of the Alai, M. Severtsof passed through the Tong Murun Pass (11,300 feet), and examined the tertiary formation at the sources of the Kashgar-darya, as far as the Kara Bel ridge on the north, determining also the southern limit of the fir. He found the country about Irkeshtam near the Kara Bel in a state of desolation, having been devastated by locusts for three consecutive years. He traced the line of migration of these locusts through Tong Murun and the Alai to Kara Kul, where they were stopped by frosts, but isolated specimens were met with in the interior of the Pamir. On his return, near the entrance of the Kizyl Yart gorge, M. Severtsof was successful in obtaining an ornithological rarity, *Falco Hendersonii*, in connection with which he has pointed out the differences between the faunas of the Pamir and the Tien-shan, remarking that many Tibetan and Himalayan species inhabit the Alai and Pamir which do not reach the Tien-shan.

Though some of the neighbouring parts of the Pamir are barren, there is more vegetation at Kara Kul, where the expedition assembled on August 12th. The approach to Kara Kul from the last pass is very picturesque, and there is a good carriage road, notwithstanding its elevation of 14,000 feet. The surface of the lake is divided into two basins, joined by a narrow strait between two hilly peninsulas, the northern of which appears to be an island, but is joined to the shore by a narrow, low sandbank, which is covered whenever the water in the lake rises. Round the lake are snow-clad heights, which, on the western sides and in parts also on the north and south, descend abruptly to the water's edge, while on the east there is a broad, sandy, salt steppe, with bright green bands of meadow-land at the mouths of the rivulets which fall into the lake. The beauty of the scenery is heightened by the peculiar shape of the mountains, the blue colour of the lake waters, and the general tint of colour pervading the whole locality, notwithstanding the comparative scantiness of vegetation, which on the Kara Kul, as on the Pamir, is only found in places. Indeed, the greater part of the whole surface of the Pamir is denuded of vegetation, the ground being covered with pebbles, sand, and saline incrustations. At the north-eastern corner of Kara Kul, in consequence of the departure of M. Rudnef through illness, the astronomical position was determined by M. Skassy, who suspended his levelling further to the south for that purpose. The other members of the expedition, having accomplished their work in this region, proceeded southwards on August 16th. The road led along the eastern shore of Kara Kul, across numerous small streams the water of which is drinkable, though that of the lake is salt. Proceeding by the valley of the northern Ak Baital River (the Chon-su of the Alai expedition of 1876), the party followed a defile, covered with enormous beds of old glacial drift, which terminates at Suok Chubir (Suok in the Kirghiz language signifying "cold"). Here, on August 17th, in the Ak Baital valley, were found vast accumulations of snow, carried thither from Kara Kul by storms during the winter. This snow does not melt till the middle of September, and even on August 19th the expedition was detained by a severe snow-storm, while the thermometer on the morning of the 20th stood at 8·6 F., and at noon at 53·6 F. The party proceeded by the Tojuk-su Pass (15,000 feet) from the northern to the southern Ak Baital River, which is an affluent of the Ak-su, and then entered on a completely unknown part of the Pamir. Notwithstanding its elevation, this pass was found to be very easy and free from snow, and though perpetual snow was lying on northern slopes at a height of 15,500 feet, the southern slopes of mountains reaching an altitude of from 18,000 to 19,000 feet are free from snow throughout the whole Pamir until the beginning of September. From the south of Ak Baital the expedition proceeded to Rang Kul by an unexplored route in the Pamir, through a wide, even, and dry valley, and carefully surveyed the whole region. The country is similar to that of Kara Kul, but is richer in vegetation and birds. The lake itself consists of three divisions or basins, two on the western side, the lower of which communicates by a narrow strait with a large marsh in which are a number of lakelets. Though the lake has apparently no outlet, it is remarkable that the water is drinkable, though in the lower division or basin it is slightly alkaline, but not so much so as that of Kara Kul. The whole lake is 20 miles in length, and from about 1¼ to 3¼ miles in breadth, and is filled by springs. On it converge only dry valleys, through which not a single rivulet flows into the lake. The surface is at the same level as that of Kara Kul, viz. 12,800 feet.

From the shores of Rang Kul a good view is obtained of the eastern ranges of the Pamir, in the rear among which are seen two lofty but not very large mountain masses, each with one principal and two or three secondary peaks. These mountain masses have a dense covering of eternal snow; the northern group of peaks (about 21,000 feet) were measured by Hayward on the road from Yang-Hissar to Kashgar, and the southern is the group seen by M. Kostenko from the Uz Bel Pass, d sketched by Colonel Gordon from Tash-Kurgan. The principal mmit rises to a height of about 26,800 feet, and is the highest peak of o Pamir. These two mountain masses are separated by a distance of miles, and between them are mountains not capped with snow, through hich runs the Taman-ata River. According to M. Severtsof's obser- tions, a continuous meridional snowy range positively does not exist ore. From Rang Kul the expedition continued their course to the Alishur Pamir, along the Ak Baital River, and crossed the Ak-su which o Shignan is called the Murghab. This river flows in a broad grassy valley with salines scattered about near its banks.

On the Ak-su M. Severtsof determined barometrically the lowest elevation recorded in the Pamir, viz. 12,000 feet. Further on, the road rises along the Kara-su, where at Djaman-Tal was found the first willow grove in the Pamir at a height of 12,300 feet, and higher up the river, at 13,200 feet, tamarisk bushes were met with. This vegetation is due to the nature of the valley of the Kara-su, which is a narrow and in parts zigzag defile; in the wider parts the stream runs in a deep ravine, and the vegetation appears only in spots protected from the gales of the Pamir. In a similar protected defile of an affluent of the Alishur River, near Yashil Kul, another willow grove was found at 12,700 feet. The road to Ali Chur rises gradually along the Kara-su and the dry bed of its tributary, the Neza Tash, to the pass of the same name. Further on, beyond Yashil Kul, the river enters an inaccessible gorge in a meridional range, which closes the Alishur Pamir on the west. Making its way through this range, it flows to the N.N.W. along the western base, and joins the Ak-su in the Roshan country, 35 or 40 miles above the junction of the Ak-su and the Piandj, at the Roshan town of Kila Wamur. Several roads lead from Yashil Kul to Roshan, Shignan, and Badakshan, all passing through the mountains which occupy the space between Ali Chur, Ak-su, and Piandj. Of these the road to Badakshan, from Yashil Kul to the south-west, is regarded by M. Severtsof as the true route of Marco Polo to the Pamir. In this region the expedition obtained specimens of the wild sheep, thus disproving the assertion of M. Kostenko that these animals were extinct in 1871–4 owing to an epidemic. If there was an epidemic, numbers of the sheep must have survived and are now multiplying. The winter of 1877–8, it is true, proved a very severe one for them as well as for the nomads on the Pamir and the Tien-shan, where animals died in large numbers from the extreme cold, and were seen by the Kashgarians in their passage through Terek-davan and the Alai, after the capture of Kashgar by the Chinese in December 1877.

In the swamps near Ali Chur M. Severtsof's party found very thick deposits of peat, and among the marsh plants of which it was composed M. Kushakewitch detected several northern species, the same as occur in the neighbourhood of St. Petersburg. From the collections and observations of the same officer it is also clear that the flora and insect fauna of the Pamir are more varied and numerous in species than might have been expected, considering the severity of the climate and the great elevation (12,000 to 15,000 feet). The vegetation presents an exceedingly original combination of Alpine plants with those of the northern Tundras and the southern Russian steppes. In this flora are seen East Siberian, Tibetan, and Mongolian species, intermingled with those of Western Siberia and the Persian mountains. In addition to the variety of plants and insects, M. Severtsof found the Pamir rich in vertebrates; he met with more than twenty species of mammalia, about one hundred and twenty species of birds, six of fishes, and in the swamps of the Alishur Pamir two species of amphibia, at a height of 12,700 feet.

M. Skassy determined astronomically the position of Yashil Kul, at the end of the peninsula between two bays on the west side of the lake. The expedition afterwards explored the other lakes of the Alishur Pamir, viz. Bulun Kul, Tuz Kul, Sassyk Kul, and Sary Kul. The surveys of M. Skassy were thus joined on to those of Captain Trotter, and one of the principal objects of the expedition was thus accomplished, viz. the connection of the Russian and English surveys on the Pamir. M. Severtsof, therefore, determined not to proceed further, but to complete the map of the Pamir by surveys and personal examination of its unexplored parts north of the Ak-su, and more particularly to the north and north-east of Rang Kul. As the provisions were insufficient for the maintenance of the expedition until their return, and as they had no means of purchasing any in Wakhan, he wrote to the Alai detachment, requesting them to forward fresh supplies. Retracing their steps from Sary Kul, the expedition were able to enrich their collections by many valuable acquisitions, and M. Severtsof collected much information in regard to the development of the glacial formation in the west of the Alishur Pamir, and also in the valley of the southern Ak Baital and in the valleys adjacent to Kara Kul. During this time M. Skassy was engaged in completing his survey along the route of the expedition and in determining the height of the various mountains. The messengers who had been despatched for provisions, failed in their errand, and instead of their bringing in anything, news was received on the northern Ak Baital that they had been plundered by a band of Kirghiz robbers. It therefore became necessary to postpone the explorations which it had been intended to make from the Ak Baital to the north-east and north-west, and even by taking the most direct route, the main body of the expedition only succeeded in reaching the Alai after enduring some privations. In spite of these difficulties, M. Skassy with a small party remained behind at Kara Kul at the point previously determined by him, in order to complete his levelling from the Kizyl Yart gorge in the Alai, a distance of about 47 miles. On the return journey of the expedition additional surveys and explorations were made at the south-west of Kara Kul, which indeed constituted some of the most important geographical work of the season, and in opposition to some previously expressed opinions, it was clearly determined that Kara Kul is not an enclosed basin without an outlet. Previous to M. Severtsof's visit to the Pamir, the opposite view had been taken by M. Kostenko, who based his opinion on an imperfect exploration of the region. M. Severtsof always entertained doubts on this subject, and on reaching the lake his doubts became stronger, when he remarked in the mountains surrounding Kara Kul two openings at the south-western and north-eastern ends of the lake. On his return journey he examined both these openings, and found that the supposed enclosed basin of Kara Kul is in reality the central widening of a very long valley, open at both ends, on the north-east to the Kok-su, the source of the Markhan-su, an affluent of the Kashgar-darya, and on the south-west to the Ak-su, the northern source of the Amu-darya. At the south-western end also there opens out to the south-east of the main valley of Kara Kul a side valley of the northern Ak Baital or Chon-su, which thus joins the Uz Bel-su. Except during high floods, the bifurcation is marked by dry beds only, under which the Chon-su sinks down through enormous deposits of sand and pebbles, coming up again near Kara Kul in springs, which are called *sary* in the Kirghiz language. During high floods these low places are submerged by the waters of Kara Kul as far as the Chon-su, and then the water flows to the south-west to the Ak-su along the bed of the lower Chon-su, rarely flowing to the south-east, as some have stated on Kirghiz authority. At the north-east the outflow of water from the lake has entirely ceased, but there remained traces of its having previously existed, which were investigated by M. Severtsof. On the steep parts of the lake-shore there were everywhere visible traces of a higher level of its waters.

The topography of the Kara Kul Valley, as observed by the expedition over the whole area between the Amu and Tarim river systems, is in striking accord with the information given by ancient geographers and travellers, and has led M. Severtsof to the conclusion that Kara Kul and the Dragon Lake of the old Chinese traveller are identical, and also that there has been a continual rise of the northern Pamir, especially to the north and north-east of Kara Kul, an opinion which is confirmed by his own geological observations and those of M. Mushketof. Other observations made by M. Severtsof on the Alishur Pamir will tend to the solution of the moot question of the route taken by the Chinese general to Badakshan in 1759, in pursuit of the Kashgarians who escaped at the time of the Chinese conquest of Eastern Turkistan.

M. Severtsof's expedition returned to Gulcha at the end of September, having solved the main questions relating to the geography of the Pamir and its orographical peculiarities. Instead of its being a high desert plateau, intersected by few and insignificant ranges, as was believed by some, even after the English and Russian surveys of 1873-6, the expedition found a system of high valleys—not a line of valleys extending from east to west, between comparatively low ranges having the same direction, as had been supposed by the late M. Fedchenko, but a network of valleys, intersected at different angles by the ranges which form the vast mountain masses. Many questions, therefore, relating to the physical geography of this region, which were before a cause of much difference of opinion, have been set at rest by M. Severtsof's expedition; besides this, much new ground has been explored, and collections made which will afford rich material for the study of its flora and fauna.

GEOGRAPHICAL NOTES.

The Society's East African Expedition.—By telegram from Dr. Kirk on the 17th of July, we learn that Mr. Thomson had completed his explorations, and left Zanzibar, by mail steamer, for England. He has successfully carried out the whole programme of the Expedition, and in a wonderfully short space of time. Since writing from Ujiji (where he obtained fresh supplies for his party) on the 16th of January, he had crossed the lake to the Lukuga outlet, and followed it down for many days' journey, being prevented from tracing it to its junction with the Lualaba (or Congo) only by the hostility of the natives. Returning then to the station of the London Missionary Society on the western side of the lake, he embarked in a native boat for the southern end, and rejoining Chuma and the rest of his followers who were there awaiting him, struck across to the east coast by a new route, exploring the hitherto unvisited Hikwa Lake on his way. Mr. Thomson may be expected in England towards the end of August.

The Climate of the Matabele Country.—A member of the missionary expedition to the Upper Zambesi region (*ante*, p. 432), in a letter which is published in 'Les Missions Catholiques,' states that the climate of the high Alps of the Matabeles, the Amatope or Matoppo Mountains, is one of the most healthy in Africa, and perhaps in the whole world; and although Gubuluwayo lies within the torrid zone, the temperature is similar to that of Naples and of Sicily in the spring. The heat is never very intense, as the thermometer shows a mean temperature of 77° F. in the summer (from October to March), while in the winter (April to September) it is 68° F. During the latter season not a drop of rain falls to refresh the earth, but from November to March the rains are extremely heavy. Terrible storms, but of short duration, succeed one another almost without intermission, and as many as seven have been known to occur in one day. The rain on these occasions falls in torrents, and in a moment the ravines are filled with rushing streams; but owing to their steep slope, the water runs off very quickly, making room for the deluge poured down by the next storm, so that no great inconvenience is caused.

The Baptist Missionary Expedition to the Congo.—The committee of the Baptist Missionary Society have recently received a letter from Mr. R. Arthington, of Leeds, offering to contribute 1000*l.* towards the purchase of a steamer to be placed on the River Congo at Stanley Pool, and a further sum of 3000*l.* to be invested, and the interest only to be used for its maintenance on the river and its affluents, as far as the first of the equatorial cataracts, beyond the Arawimi and Mbura rivers. Mr. Arthington further stipulates that two stations shall be formed as early as possible at the mouths of the Nkutu and Ikelemba, and that by way of the Mbura River partly, and along the parallel of about 1° north latitude, an attempt shall be made to open a route direct east from the north bank of the Congo to join an extension of the London Missionary Society's Tanganyika expedition to Albert Nyanza. Mr. Arthington is also desirous that the dialects spoken throughout the whole region should be carefully noted and classified, and a comparison made with the London Missionary Society's collections, with a view to the selection of the most suitable dialects for translation.

Italian Explorers in Africa.—Further news has been received of Dr. P. Matteucci's progress in his journey towards Wadai, in Central Africa, to which a brief allusion was made in our May number (*ante*, p. 317). The party accomplished in eight days the 250 miles between Khartum and El Obeidh, the capital of Kordofan, experiencing excessive heat and an almost entire want of water on the road. No trees or hills were seen; the country consisting of immense plains covered with red, ferruginous sand, and remarkable for the absence, not only of human inhabitants, but of animals; a condition of things which Dr. Matteucci thinks not likely to be changed for the better. The wells, which are dug to a great depth, only give water at a temperature of from 80° to 90° F., and even that is diminishing every year. In former times there was no necessity for them at all, the rainfall collected in reservoirs every year being sufficient for the wants of the population; but this source of supply having become irregular, the people were obliged to have recourse to wells. Eight years ago water was found everywhere at a depth of a foot and a half, while at the present time the wells have reached a depth of over 160 feet, and they can be carried no deeper, as enormous masses of granitic rock form the under stratum. Obeidh is the centre of a large trade in gum and ostrich feathers, the former of which is collected in the woods by the women and children, and taken to their villages; it is there disposed of to petty traders and conveyed to the capital for sale to merchants, who forward it to Europe. The ostrich feathers nearly all come from Darfur, but were formerly brought from Wadai. The road being now closed, the feathers from the latter country are sent to Europe by way of Tripoli. Owing to the orders of the Governor-General of the Soudan, the Italian explorers were received with every consideration in Kordofan, but beyond Obeidh Dr. Matteucci expected to be obliged to move more slowly, as the assistance of the Egyptian authorities would not help him much. He had not yet determined whether, on reaching the western frontier of Darfur, he would endeavour to enter Wadai at once, or whether it would be better for him to pass the very hot season in the Jebel Marrah. He had, however, made up his mind to try all the routes into the country, and, if refused an entry, to direct his course to the south.—The Italian Geographical Society have received intelligence of the death of Signor Chiarini on the 5th of last October, when on his way with Captain Cecchi from Shoa, viâ Kaffa, to the equatorial lake region. The two travellers are said to have been seized as spies and ill-treated in Chera, a small district tributary to the king of Shoa, and Captain Cecchi appears to have had great difficulty in sending news of the death of his companion.

Dr. Gerhard Rohlfs' Exploration of the Jofra Oasis.—Dr. Rohlfs has published in the 'Journal' of the Berlin Geographical Society* a description of the Jofra (Djofra) Oasis, accompanied by a map constructed by Dr. Strecker, on which the position of Sokna, formerly placed too far to the north, is now correctly given. According to Dr. Strecker's observations, it is now placed in 28° 56′ N. lat., 16° 15′ E. long. As Sokna is situated at an elevation of 880 feet above the sea-level, the temperature is not unpleasantly high. The clouds carried from the Mediterranean to the mountains on the south are there condensed, and the consequent rains have eroded the surface into valleys throughout the oasis. Dr. Rohlfs alludes to the phenomenon of the zodiacal light, which he saw nearly every night on the road from Tripoli to Sokna; and with regard to electricity, which has such powerful effects in this region, he thinks that it is evolved by the attrition of the grains of sand on the volcanic soil during storms. It is certainly remarkable that the phenomenon in question is seen only when the air is dry.

American Arctic Expeditions.—From the address of the President of the American Geographical Society on the progress of geography in 1878 and 1879, we gather that no news later than that contained in a letter dated March 31st, 1879, has been received from the expedition sent in search of Franklin relics. The party, consisting of Lieutenant F. Schwatka, Colonel H. Gilder, the Esquimaux Joe, and others, were landed by the *Eothen* near Depôt Island, in the north of Hudson's Bay, on the 9th of August, 1878, in order to search for some remains (supposed to include Sir John Franklin's Journals) which were reported by two Netchelli Esquimaux to exist on an island in the Gulf of Boothia. In the autumn of 1878 Lieutenant Schwatka surveyed the coast from Baker's Foreland to Cape Fullerton, which he reports to be erroneously laid down on the charts, and to have a totally different curvature, with two rivers flowing into it and a bay at the north. In the following spring the party made a sledge journey to King William's Land by way of a river which they named the Connery. Another river, running north-west for an estimated distance of from 95 to 100 miles, was discovered by Colonel Gilder during a land journey. A large lake, about 50 miles long, was also discovered and named Brevoort Lake. Lieutenant Schwatka, Chief Justice Daly adds, has forwarded drawings of their encampment and the surrounding country, as well as a map of the coast surveyed. — Captain H. W. Howgate's expedition to Franklin Bay, referred to in Lord Northbrook's address (*ante*, p. 406), started at the end of June in the steamer *Gulnare*, which, we regret to learn, was obliged to put into St. John's, Newfoundland, in the first week of July, with her machinery disabled. It was thought probable, however, that she would be sufficiently repaired by the end of the month to proceed on her northward journey.

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* Vol. xv. part 2.

Professor Nordenskiöld's Collections. — The natural history and ethnographical collections, brought from the coasts of Siberia and Eastern Asia by the *Vega* expedition, have been arranged in the Royal Library at Stockholm, and invitations were issued by Professor Nordenskiöld to naturalists and geographers to visit the exhibition, which was opened on July 7th.

The Position of the Crozet Islands.—The Admiralty have received from Captain J. N. East, R.N., of H.M.S. *Comus*, a report of his visit to the Crozet Islands, early in March, in order to ascertain if any shipwrecked people were there, and to endeavour to establish a depôt of provisions. No trace of any shipwrecked crew was discovered, but the stores of provisions and shelter-huts were successfully landed. The most important information which Captain East communicates with regard to this group, is that Hog Island should be placed 13 miles north and west of its present position on the Admiralty chart. The position of the other islands with regard to it appears to be laid down with tolerable accuracy, excepting that East Island is not more than seven miles distant from the south-east point of Possession Island. The Heroine breakers are reported to consist of one breaker very similar to the Bellows off the Cape, and to be only one and a half mile to the eastward of a straight line drawn from the south end of Hog Island to Penguin Island, and nearer the former island.

Mr. Whymper's Ascent of Antisana.—We have received from Mr. Edward Whymper an account of his ascent of this famous mountain, one of those lofty peaks which dominate the elevated valley of Quito. Antisana rises from the eastern ridge of the Andes, about 30 geographical miles to the south-east of the capital, and overlooks on the one hand the forest-clad valley of the Napo, sloping down to the Amazons, and on the other the central valley of Ecuador.—Accompanied by the brothers Carrel, the two Swiss mountaineers whom he took with him to South America, Mr. Whymper made his first attempt on the 7th of March, starting from the farmhouse Antisanilla, distant two hours' ride from the foot of the mountain. He reached on this occasion the altitude of 18,000 feet, but all his efforts—and he struggled for several hours—to find a passage across the fearful crevasses proved fruitless, and he was obliged to return unsuccessful. Having recovered from an attack of blindness, brought on by uncovering his eyes at the great elevation the better to find a way amidst the dense clouds which enveloped the summit, he started again at daybreak on the 10th of March, camping out the previous night nearer the foot of the mountain than on the former attempt. Up to 17,000 feet no serious obstacle was encountered and the party ascended at the rate of 1200 feet an hour. But their difficulties then commenced. The crevasses in a vast ice-field here lying in the way were of enormous width and depth; they surpassed everything that Mr. Whymper had seen of this nature in any other mountain region. For a time he thought he should have been compelled to turn back and make a renewed attempt in another direction; but at the most difficult part a passage across the crevasse presented itself, in an opportune bridge of snow, 60 feet in width, suspended over an abyss, the depth of which was lost to view beyond 150 feet. The bridge formed the only practicable path to the summit, and would probably soon disappear. Beyond it, the remainder of the ascent was less difficult. They soon reached the summit, and although the thick mist prevented their seeing further in any direction than about 50 feet, they succeeded in finding their way to the highest point by 10.20 A.M. Here they took the altitude by means of a mercurial barometer (which Jean Antoine Carrel had carried with devoted care all through the journey) and a set of boiling-point observations; the result of the two barometrical observations showing the height to be 19,092 feet, the boiling-point thermometers indicating 18,676 feet.* The clouds which enveloped the summit prevented Mr. Whymper from enjoying the view which he had looked forward to over the country of the Napo.

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* As computed by Mr. J. Coles (Map Department, R. G. S.) from Mr. Whymper's data. No simultaneous observations at the lower stations having been furnished, the computations must be considered approximate only. The temperatures and barometric pressure used in the computation are the means for March, as given by Dove, Mohn, and Buchan, viz. 77° Fahr. and 29·9 inches.—Ed.

The only chance of finding a clear sky, he says, would be by passing the night on the top of the mountain. A singular and inexplicable phenomenon was the great variation in the temperature, his three thermometers oscillating in perfect accord between 45° and 60° of Fahrenheit, and varying frequently five degrees in as many minutes. The summit is not broad and compact as had hitherto been supposed, but is divided into two, a formation not perceptible until a considerable height has been reached. The two eminences are composed of four principal peaks, of which two are higher than the others, and one of them conspicuously the highest of the whole. Mr. Whymper failed to detect any sign of volcanic activity, and saw no distinct crater formation at the summit; but he speaks with diffidence on this subject, for although the summit extended as a broad snow-field for a long distance on the eastern side, he saw, in another direction, an escarpment some 1200 feet in height, with a slope of about 50°; the shifting mist, however, prevented him from making out the outlines of a crater. He saw on his first ascent, lower down, puffs of highly sulphureous vapour, but nothing of the kind was observed at the summit of the mountain.

Exploration of Patagonia.—Don Ramon Lista has lately returned to Buenos Ayres after a further journey of exploration in Patagonia, in the course of which he has examined in detail the whole of the coast region between Bahia Rosas and Punta Villarino. From the outset he was unable to find any water, notwithstanding that careful search was made in all directions, and the expedition would have been compelled to retrace its steps, had it not been for the opportune arrival off the coast of a small vessel with supplies. The region explored is reported to be extremely sterile, and the soil, which is 'burnt up by a tropical sun, is mostly covered with prickly and stunted plants.

The Kemp-Welsh River of New Guinea.—We have received from the Rev. Thomas Beswick, a missionary stationed at Hood Bay, on the southern coast of New Guinea, a short description, accompanied by a sketch map, of the river known as the "Kemp-Welsh,"* which empties itself into the bay. Mr. Beswick has ascended the river for about 18 miles, and gives the width as varying from 75 to 120 yards, and the depth in mid-channel from half a fathom to three fathoms. The current on his up-journey flowed at the rate of 1¾ knots an hour, but on his return it had increased to three knots. There is an obstruction at the mouth of the river, caused by an accumulation of drift wood in the narrow channels lying between two islets close to the entrance; but beyond this the stream is clear. The large and populous village of Kalo is built at the mouth, and the banks of the river for 11 miles from the town are lined with well-kept plantations. From the inhabitants of some small villages 16 to 18 miles in the interior, Mr. Beswick learnt that the river continued for about 20 miles further, its bed much encumbered with boulders, and that further still, in a N.N.E. direction, near the foot of a mountain (named Mount Obree on his map, 10,246 feet high), it expanded into a large sheet of water. Large tracts in the interior appear to be very thinly, or not at all, peopled, and the natives in every respect are inferior to those of Hood Bay.

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* Conf. 'Proceedings,' *ante*, vol. ii. p. 316.

Forrest's Journey through North-Western Australia.—We have received from Mr. Alexander Forrest the following account of his recent successful journey in North-Western Australia, which contains many details in addition to the brief notice we have already given in the February number (*ante*, p. 126). Mr. Forrest has also sent a copy of the excellent map of his route lithographed at the Surveyor-General's Office at Perth, Western Australia:—

A fresh expedition to explore the unknown country lying between the settled districts of Western Australia and Cambridge Gulf, having been resolved upon by some of the leading colonists of Western Australia, a party was formed early in 1879, the command of which was given to me; it consisted, besides myself, of Mr. Fenton Hill, second in command and geologist, Messrs. James Carey, John Campbell, Arthur Hicks, Matthew Forrest, and two natives. Our starting-point was the town of Roebourne, near to Nickol Bay. We had twenty-six horses, and provisions for six months. We left the De Grey on the 25th February, taking a north-east direction, and camped the first day at Condon. For several days the journey lay through worthless spinifex country, but on the 7th of March we came to open plains of grass, which we continued to travel over for some distance. On the 13th we came to a small creek full of water, where we rested, there being splendid feed for our horses. The previous day we encountered four natives on the plains, who seemed very much frightened at our appearance, having probably never seen white men before. We went inland from the coast 20 miles from here, but the country did not appear very promising. Continuing our journey northwards nearly along the coast, we found the same grassy country, with the exception of a mangrove swamp.—On the 17th we had a fine view of Lagrange Bay, which will some day be a place of importance when this country is taken up and stocked. On the 20th we reached Roebuck Bay. The mosquitoes here are very bad; they are of a peculiar grey colour, with a most piercing and painful sting. To sleep at night was out of the question with these tormentors, and the want of refreshing sleep was a serious evil for our party.—Still going northwards, through good pastoral country, we came to boggy ground covered with water, and the grass 10 feet high. Then followed a stretch of high tableland, nearly all the way to Beagle Bay, fairly grassed and lightly timbered. On the 26th we saw the palm-tree growing for the first time. On the 9th April we all reached Beagle Bay, and here we found three small vessels engaged in pearling, by which we sent letters to Perth. Large numbers of natives were seen here, and they appeared very amicably inclined. On the 21st we again left Beagle Bay, travelling about east to King Sound, and thence along its shores to the Fitzroy River, passing numerous watercourses, and one large river which we followed to its head about 30 miles inland. On the 8th of May we struck the Fitzroy, a magnificent stream of water about 4 chains wide, and running strong, its banks being splendidly grassed. This noble stream is the main artery and outlet of a most beautiful extent of territory, suitable in the highest degree for pastoral purposes. Following it up for several days towards its head-waters, we fell in with various tribes of natives, who are very numerous. I was able to note their manners and customs. They are for the most part a race of tall and well-made men, quite equal in appearance to any of the southern tribes, and physically superior to most of them; they were perfectly naked, and I observed that the adult males had the two front teeth knocked out, as well as all of them being circumcised. These marks of imitation are universal amongst the natives of the northern part of the continent; it was evident they had never seen whites before. The women, however, we could not get a sight of. We offered them damper, but in no case could they be induced to accept this food. The tribes along the Fitzroy are excellent fishers, and they have an ingenious method of catching their prey; they build a series of dams across a stream, leaving a sluice open in each, and then while several of them whip the pools, another takes the fish in grass nets, as they make in their fright for the sluice.

On the 18th of May we swam the Fitzroy, making a raft of four water drums to float our arms and clothes across. The next day we saw large ranges running east by north, which I named the Ord Ranges. Continued travelling up the Fitzroy till the 1st of June, when we again crossed it, having followed it for nearly 240 miles, it being the longest and best river in Western Australia, and, as far as I could judge, navigable for a long distance. We were unable to follow it any further on account of the rough nature of the country. From the Fitzroy we travelled under the foot of a high table range 2000 feet high to Collier Bay, but were unable to get any further north towards the Glenelg, owing to the rough nature of the country. We then had to retrace our steps back to the Fitzroy, and followed up its eastern branch for 100 miles, passing over some splendid feeding country, and finally striking the Victoria River it its junction with the Wickham. The whole of this long stretch of country ras magnificently grassed and well watered by numerous streams, and will, I hope, re long be the home of a large population. From the Victoria we had some difficulty in finding water to the Overland Telegraph line, but after some trouble and rivations we all reached the Katherine Telegraph Station, about 200 miles from 'ort Darwin, on the 29th September.

In conclusion, I beg to make the following observations:—

1st. The extent of good country I calculate is equal to 25,000,000 of acres, uitable for pastoral purposes, and a portion for tropical produce. The country on ach side of the Fitzroy, from its mouth in lat. 17° 42′ and long. 126°, running from 0 to 30 miles back from the river, is well grassed, suitable for sheep, horses, and attle; it is, however, liable to floods, the whole of these magnificent plains being requently under water during the rainy season, which lasts from December to March, nd stock would necessarily require removal at that time to the higher ground some ive miles back from the river banks. Assuming that the entrance to the river presents no obstacle, the Fitzroy would, I believe, be navigable for small steamers at east 100 miles from the sea.

2nd. Between the Fitzroy and the coast at Secure Bay, lying at the foot of the reat Barrier Range, is a stretch of country very rough and hilly, softening down nto a less rugged and far superior description the further you advance from the ange; but even this hilly rough ground is available for pasturage, the grass growing ver the summits as well as clothing the valleys. Secure Bay seems a good place or a settlement. There is a plentiful supply of fresh water from running springs, nd the land all around seems well adapted for the cultivation of tropical produce; he port to all appearance is first class, almost landlocked, and bearing rather a trong resemblance to King George's Sound. From the Fitzroy to the 129th degree f longitude, the boundary of Western Australia, the large extent of splendidly rassed open country through which we passed was well watered by numerous ivers and running springs, and is most probably a continuation of Gregory's

Denison Plains. This large area has the advantage of not being subject to those periodical inundations which are a serious drawback to the valley lands bordering most of the rivers in tropical Northern Australia. The natives were friendly all through our journey, and are, I imagine, unlikely to prove a source of any annoyance to future settlers. Many of them wear pearl ornaments, which leads me to suppose that pearl-shell banks will in all probability be found between Beagle and Collier bays; and if so, the pioneer settler on that part of the coast will have no difficulty in procuring labour, the natives being there in very large numbers. Since I have returned from my late exploration, large tracts of country have been taken up, and the settlers are already sending stock to this magnificent country. Also a vessel lately engaged pearling in King Sound succeeded in getting 21 tons of shells in twenty-five days, proving beyond doubt that my report as to shells existing all the way to Secure Bay is a certainty. The Government are about to found a settlement at Beagle Bay, or near the mouth of the Fitzroy, which will prove of great assistance to the pioneer settlers. Thus the country I have discovered is already attracting capitalists, and will before long be the most important part of Western Australia.

Obituary.

Père Antoine Horner (Honorary Corresponding Member R.G.S.), whose de has already been briefly recorded, in our account of the Proceedings of the Geog phical Society of Paris on May 21st (*ante*, p. 387), was born in Alsace on June 20t 1827. In 1854 he went to the Island of Réunion, whence he was transferred Zanzibar in June 1863, to superintend and develop the mission which had bee established there some three years previously. He soon set himself to work to ai in the suppression of the slave-trade, and he is said to have rendered great service i this direction to Sir Bartle Frere during his mission in 1872. In March 1868 h founded an agricultural establishment at Bagamoyo on the mainland, of which Si Bartle Frere spoke in the highest terms. When he had put matters in train at Bagamoyo, Père Horner undertook a long journey of exploration in Ukami, Ukuéré, and Usegura to search for favourable localities for new stations, and the result of this expedition was the founding of the station at Mhonda, in the Nguru Mountains. The fatigues he went through during the journey told severely on his constitution, already enfeebled by the debilitating climate of Africa, and his health became eventually so much impaired that at the end of May 1879 he was compelled to return to France. He spent the past winter at Cannes, and received so much benefit that it was hoped he might recover; his constitution, however, was too much injured, and he died last May, within a year of his leaving Africa. Père Horner was elected an Honorary Corresponding Member of our Society in January 1873, and he had received similar recognition of his services to geography from other geographical societies.

Carl Petersen, the stout-hearted and faithful assistant to so many Arctic expeditions, in which he served chiefly as interpreter, died at Copenhagen, on the 24th of June, at the age of sixty-seven years. We learn from our Honorary Corresponding Member, Admiral Irminger, that he succumbed to an attack of inflammation of the lungs. The brave old Dane's services were spread over many years. He was with Penny, driving his dog sledge, in 1850–51, when Penny wintered in Assistance Bay with the two brigs (*Lady Franklin* and *Sophia*) and explored part of Wellington Channel. Next he was with Kane in Smith Sound, then with McClintock in the *Fox*, and lastly in a voyage with Torell and Nordenskiöld to Spitzbergen in 1861.

He was a fine old fellow—resolute and warm-hearted. Sir Allen Young introduced him to the Prince of Wales the last time he was at Copenhagen. Petersen had charge of a lighthouse until 1875, when he retired owing to failing sight—on a pension of 600 kronen. The English Government had recently granted him a pension of 12*l.* a year, and last winter a number of Arctic friends in this country subscribed together and presented him with a small sum. These acts of kindness were deeply felt by the grateful old man, but he lived but a short time to enjoy the increased comfort they afforded him. He lived with his sister, whose husband kept a restaurant at Copenhagen. In early life he was long stationed at Upernivik, and married there. He leaves a son who is a surveyor, and a daughter who married well.

PROCEEDINGS OF FOREIGN SOCIETIES.

Geographical Society of Paris.—June 18th, 1880: M. A. Grandidier in the Chair.—In reference to the minutes of the previous meeting, Dr. Harmand made some remarks on the indiarubber reported by M. Soleillet to be found in the Adraar country near Senegal. He said it was well known that there were a number of plants at Senegal capable of furnishing this valuable article of commerce, and many specimens might be seen in the *Musée des Colonies* at Paris. What was of more importance to know was whether a trade in the product was commercially possible, regarding which he entertained some doubt.—MM. Maunoir, Duveyrier, and Jackson were appointed delegates of the Society at the meeting of the Congress for the Advancement of Science to be held at Reims in August.—M. de Ujfalvy presented his adieux to the Society on his approaching departure for Turkistan. Travelling viâ Orenburg, he expects to reach Tashkend towards the end of September, and to pass the winter in Samarcand. In the spring of 1881 he intends to explore the upper valley of the Zerafshan (the country of the Goltchas), Karategin, Shignan, Wakhan, Badakshan, and Afghanistan, and to make excavations at Balkh, returning to Europe, should circumstances permit, viâ Persia and the Caucasus. He is accompanied by M. Bonvallot as naturalist, and will keep the Society furnished with an account of his proceedings.—A paper was then read by Professor Paquier on Afghanistan. He said that the recent English expeditions had modified completely our geographical notions with regard to the southern part of this country, or what is otherwise called Afghanistan Proper. The English geographical discoveries relate to three principal points:—(1) In the north-east the upper basin of the Kurram, inhabited by tribes of Turks and Jagis, neighbours of the Afridis. (2) In the south the elevated plain of Pishin, the Toba Plateau, and the three routes, more or less parallel, which start from this point in the direction of the Indus at Dera Ghazi-Khan; and (3) In the south-west, the basin of Lake Abistada and the course of the Arghesan. In the north-east Captain Gerald Martin has taken scientific possession of the upper region of the Kurram, surveying the important localities, such as the Paiwar Kotal, the Lokerai Kotal, the Shutar-gardan, which afford access to the Argob, the plain of Jalalabad and Kabulistan proper; and he has also given interesting details regarding the manners and the traditions of the tribes that inhabit this region. In the south and south-east Major-General Biddulph has revealed for the first time the strategical importance of the elevated plain of Pishin, much larger than the plateau of Toba, which dominates it from the north. M. Paquier believed that this was the chief discovery of the English in the interior of Afghanistan; commanding, as it does, the Bolan Pass and Quetta to the south, the route of Candahar and Ghazni to the west and north-west, the valleys of the Zhob, Borai, and Tal-Chotiali to the east, it constitutes what might be termed the true political nexus of the Afghan question, which the Anglo-Indian Government will with difficulty consent to give up. With the name of General Biddulph in this important exploration are associated the names of Colonels Browne and Prendergast, Major Campbell, Captains Holdich, Malcolm Rogers, Beavan, and Lieutenants Gore and Temple, whose labours have contributed largely to the success of the enterprise. M. Paquier added that the basin of Lake Abistada, far from being a closed basin, as was previously supposed, is drained to the south into the river Arghesan, and places thus in direct communication the two large towns which command Central Afghanistan, namely, Ghazni and Candahar.—An address on the subject of his explorations in the island of Rhodes was then delivered by M. Victor Guérin. He had visited every village in the principal districts in 1874, and published an account of his journey, which he was now engaged in revising. The population of the island, he said, was not more than 27,000, consisting of 6000 Turks, 1000 Jews, and 20,000 Greeks. The Greeks inhabit the three suburbs of the capital and the forty-seven villages of the island; as to the Turks and Jews, they are found scarcely anywhere except within the ramparts of the town of Rhodes. He described the remains of the three ancient towns, Lindos, Camiros, and Ialysos, which, according to Homer, sent each to the Trojan war their contingent of warriors. Lindos (Lindo) is still a place of some importance. Of the ancient town there still exist the remains of a magnificent mausoleum, a theatre, and a temple dedicated variously Jupiter, Minerva, Apollo, and Diana. The Acropolis still presents a few *débris* of temple dedicated to Minerva. Near the ruins of Camiros, which bear witness to the importance of this town, are the remains of the Acropolis, the excavations on which by Salzmann, had proved the city to have been inhabited by the Phenicians before the Greeks. The vestiges of Ialysos consist of a few tombs excavated in the rock traces of a temple, and of the wall of the Acropolis, which served as a fortified castle in the time of the Knights.—M. Revoil, the traveller in Somâli-land, who has recently published an account of his journey under the title of 'Voyage au Cap des Aromates,' announced his intention of returning to Somâli-land and penetrating into the interior of the country as far as possible.

—— July 2nd, 1880.—M. A. Grandidier in the Chair.—A letter was read from MM. Duvert and Fabre, of Lille, on the subject of the famous rock on the coast called *La Demoiselle de Fontenoye*, which it was considered important to preserve against the agents of destruction and the waves which were eating into it. A subscription which had been collected had sufficed to construct supports on the S.S.E. side; but the funds were exhausted and buttresses to protect the north-eastern side were still required: the assistance of the Society was therefore requested. The subject was referred to a committee.—The President announced the presence at the meeting of Dr. Fr. Moreno, the Director of the Anatomical and Archæological Museum of Buenos Ayres, a gentleman well-known to all who were interested in the geography, and especially the anthropology of South America. Dr. Moreno, in 1873, made his first journey to Patagonia for the purpose of investigating the ancient cemeteries of the Indians of the Rio Negro, and after two months' work returned to Buenos Ayres with forty-two crania and many hundred specimens of stone implements. In 1874 he went again to the Rio Negro; his researches then being rewarded by the detection of eighty crania, a few incomplete skeletons, and 500 stone utensils and implements. From the Rio Negro he passed to the River Santa Cruz for the purpose of endeavouring to ascend the stream, and although various obstacles prevented him from achieving his geographical exploration, he succeeded in adding to his ethnographical collections from places near the sea. In 1875 he started on a third journey by land from Buenos Ayres. Travelling through Patagonia he again reached the Rio Negro, and added further to his collections of ancient crania. Continuing his journey with a servant and five Indians, he followed the banks of the river up to the Andes. There the Araucanians, or Mapuches, prevented him from pursuing his course to Chili. They called a council of war to consider his case, and he was accorded by it permission to visit the lake Nahuel-Huapi. After some weeks employed in hunting, in orgies, and in religious festivals, the savages consented to his returning to Buenos Ayres, before reaching which he had to do battle with a gang of cattle-stealers. His next journey was to the north of the Argentine Republic, his object being to examine the ancient forts and villages of the Calchaguis Indians. In October of the same year he made a fourth journey to Patagonia, and put into execution his deferred exploration of the River Santa Cruz. Ascending in a canoe, he succeeded in reaching a lake from which the river issues, and discovered to the north two other lakes, and a volcano in activity to which he gave the name of Mount FitzRoy. Travelling and living with Patagonians, he reached by land the shores of the Straits of Magellan, whence he returned to Buenos Ayres. He then made a present to the Argentine Government of his entire collection in anthropology, zoology, and palæontology, and a museum was thereupon founded, of which he was nominated director. With a view to still further increasing the collection, he set out in October last (1879) for another journey to Patagonia. He ascended the Rio Negro in a small steamer for 250 miles, and then rode on horseback 60 miles in a southerly direction, afterwards striking W.S.W. through a region entirely unexplored. Here, instead of plains and plateaux, mountains from 3000 to 4000 feet were met with. Some were recognised as extinct or dormant volcanoes, and amongst them were basaltic caves which had been used as habitations by the Indians. Some crania were here found. In latitude 43° 30′ Dr. Moreno reached the foot of the Andes and met with Indians. After some days' stay here, he resumed his route towards the north. He explored the shores of the lake Nahuel-Huapi, where he found grottoes with bones, and it was here, at the western extremity of the lake, in the midst of a magnificent forest, that he was taken prisoner by the Araucanian Indians. He was taken by them to head-quarters, where the principal chief resided, whose acquaintance he had made in 1875. Tried by council of war, he was sentenced by the head medicine-man, after a three days' festival, to death; "God was in wrath," said the sorcerer, "and we must make an offering to Him of the heart of a Christian." Dr. Moreno escaped from the hideous fate prepared for him, by night, two days afterwards—he, his servant, and interpreter. They constructed a raft, and after two nights' and seven days' struggle with rapids, they reached an Argentine encampment. His companions, who had been left in a village of friendly Indians, saved his collections, and all reached Buenos in safety. —The Secretary of the Society announced to the Meeting the departure, that same evening, of M. de Ujfalvy, on his expedition to Turkistan. He added that M. Bischoffsheim, the scientific Mæcenas, so well known for his inexhaustible munificence, had taken upon himself the cost of an additional scientific assistant to the Expedition, viz. Dr. Capus, of the Museum, who would accompany M. de Ujfalvy as botanist and geologist.—A paper was read by M. le Comte Meyners d'Estrey (Director of the 'Annales de l'Extrême Orient') on the district of Sumatra in which M. Wallon was assassinated.

Geographical Society of Berlin.—May 8th, 1880: Dr. Nachtigal, President, in the Chair.—Before the ordinary business of the meeting, the President spoke a few words of cordial greeting to Mr. Carl Humann, the discoverer of the relievos at Pergamus which now adorn the Royal Museum in Berlin, and to Dr. v. Wojeikof, well known for his meteorological and climatological researches, who were both present as visitors. He then informed the Meeting that Dr. Kayser, who is to accompany the East African Expedition in a scientific capacity, had left Berlin in order to join the other members of the Expedition, i. e. Captain von Schöler, the zoologist Dr. Boehm, and the civil engineer, Mr. Reichardt, at Zanzibar. In connection with this subject, the President announced the proposed establishment of a French station in Usagara in East Africa. Whether the southern end of Lake Tanganyika or a place nearer the sea-coast would ultimately be selected as a site for the German station, remained as yet an open question. The important part which this lake is likely to play in the immediate future might (he said) be judged from the fact that a transport association is about to be founded at Bagamoyo and Tabora, for which object the well-known philanthropist, Mr. Arthington, of Leeds, had offered a sum of 3000*l.* to the London Missionary Society, on the condition that the latter should place a steamer on Lake Tanganyika. Since the visit of the English geologist, Mr. J. Thomson, the companion and successor of the late Mr. Keith Johnston, whose premature death was so much to be regretted, and of the missionary, Mr. Stewart, Lake Tanganyika had become a subject of renewed interest, for these travellers are inclined to reject Mr. Stanley's hypothesis of a steady increase in the volume of that lake, and consider a periodical rise of its waters more probable. About the same time, the western shore of the lake has been explored by Mr. Hore, who had been led, after a careful examination of the Lukuga River, to consider it established as the actual outlet of the lake, first asserted by Cameron, but questioned by Stanley.—The President then announced that Dr. Oscar Lenz, the traveller sent to Morocco by the German African Society, had crossed the Atlas Range between Marrakesh and Terodant in the Wadi Sus by a pass situated 4000 feet above the sea-level, and never before used by an educated traveller from Europe. The pass begins at the village of Imintjanut, and ends in Wadi Sus at the village of Mislah, both not unimportant places on the caravan route between Morocco and Wadi Sus. The passage of the mountains, which here divide into four distinct ranges, offered many difficulties, amongst which was the hostile attitude of the Berber population, which necessitated the greatest caution on the part of the travellers. Not less dangerous proved the five hours' march from Mislah to Terodant, since the road passes through the settlements of the robber tribes known as the Howara-Kabyles, who are in the habit of attacking every caravan not sufficiently armed. The people of Terodant made some resistance, and the shedding of blood was only hindered by the intervention of the sherif of that town, to whom Hadj Ali, the companion of Dr. Lenz, had been recommended. As previously mentioned,* Dr. Lenz travels in the company of Hadj Ali, a nephew of the celebrated Abd-el-Kader, and under the disguise of a Turkish doctor of Constantinople. By a few lines, dated April 3rd, Dr. Lenz announces his arrival at Iler. This town is the residence of the powerful religious chief Sidi Hussein, a son of Sidi Hedjam, who barely acknowledges the suzerainty of the Sultan of Morocco. On the following day the traveller intended to start for Timbuctu, an enterprise which, now that he has entered the Sahara under the guidance of Hadj Ali, who has already performed the journey several times, is sure to be successfully accomplished. In taking this step, Dr. Lenz has abandoned the exploration of the Atlas Range, the task entrusted to him at the outset by the German African Society, in order to take up a new aim, the attainment of which, however, is of not less importance to the interests of geographical science.—The Meeting was next addressed by Mr. Humann on the subject of the geographical position of the ancient Pergamus, and the antiquarian discoveries made by him in that locality; also by Dr. v. Wojeikof on the climatic causes of glacial epochs.

—— June 5th, 1880: Dr. NACHTIGAL, President, in the Chair.—The President announced that the Council of the Society had decided to make arrangements for an extraordinary meeting of the Geographical Society on the occasion of the Anthropological Congress which is to commence in Berlin on the 5th August and to conclude on the 12th, for the especial purpose of discussing the proposed foundation of an Imperial German Geographical Society, a project for and against which much has been said.—News has been received from the members of the expedition to East Africa of their safe arrival at Zanzibar and of their preparations for the journey to Lake Tanganyika. The Meeting was also informed that Mr. Gerhard Rohlfs had been chosen to convey letters and presents from the German Emperor to the ruler of Abyssinia, in reply to a message sent by the latter to the Emperor, and that Dr. Strecker, the former companion of Mr. Rohlfs on his expedition to the Kufra Oasis, who is at present stopping in Tripoli, and had made preparations to start for Bornu, has received instructions to proceed also to Abyssinia in order to make an attempt to penetrate from thence into the Central African lake region.—According to information received from S. Paolo de Loanda, Dr. Buchner is reported not only to have entered the empire of Muata Yambo, but to have already left that territory in an unknown direction. No direct communications having come to hand from Dr. Buchner, this news requires confirmation.—A large number of boxes containing natural history specimens have been received from Mr. Hildebrandt, together with a report of his journey into the north-eastern parts of Madagascar. Upon the island of Nosi-Kómba, lying between the island of Nosi-Bé and the coast of Madagascar, the traveller examined a burial-place of the Sakalava, situated in an almost inaccessible spot in the cave-like clefts of the rocks near the sea-shore, where he gathered several Sakalava skulls. A number of interesting objects were also collected by him during his navigation of the River Semberáno, which flows through a territory ruled by a queen independent of the Hovas. The district offers facilities for the cultivation of sugar, cotton, and rice; but owing to the present state of affairs in Madagascar, any attempt at colonisation is out of the question.—Baron v. Schleinitz addressed the Meeting on the present state of Polar research, and on the problems which, as regards the exploration of the Polar regions, require immediate attention. — Mr. Humann subsequently spoke on the ethnographic relations of the populations of the Western portion of Asia Minor.

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* Vide 'Proceedings R. G. S.,' *ante*, pp. 196 and 432.

—— July 3rd, 1880: Dr. Nachtigal, President, in the Chair.—The President communicated to the Meeting further news regarding the movements of the traveller Dr. Oscar Lenz, from whom a letter had been received, stating that before his departure from Terodant he had to contend with many difficulties, as the kadi of that town refused to give guarantees for his safety while passing through the territory of the Howara-Kabyles. Several attempts which the traveller made to join a large caravan of Terodant merchants, about to start for the three days' fair at Hamed ben Musa in the territory of Sidi Hussein, failed owing to the fanatical opposition of the people, so that at last he was compelled to entrust his safety to some robber chiefs of the Howaras, in whose company he left Terodant on the 27th March, and who effectually, in return for good payment, conducted him unmolested through the ill-famed district. Not until he reached Iler, in the territory of Sidi Hedjam, however, could the traveller consider himself secure from danger. In every direction the country appeared to be well cultivated and the population numerous. He stopped four days at Iler, and then continued his journey over a plateau and a river-valley of the same name, until he found himself at the foot of a range of mountains stretching from south-west to north-east with an average height of 4000 feet, while some of the summits rose to 5000 feet. The descent of this range on the other side turned out to be not very abrupt but tedious, as water was scarce and the country rendered unsafe by robber tribes. Lower down, the valley spreads out into a large plain, covered with magnificent palm forests, amongst which the little town of Temenet lies concealed. Here, as well as at Iler, the population chiefly consists of Berbers. A few miles to the south of Temenet the mountains open out completely, and the traveller obtains his first glimpse of the Sahara. About four miles to the east of Temenet lies the small town of Ijt, behind a mountain, and four miles further on is the village of Akka, the native home of the famous Rabbi Mardochai, so often heard of in recent times. From Temenet Dr. Lenz travelled westwards into the mountains, and at last arrived at Fum el Hossan, the residence of Sheik Ali of the Kabyle tribe of Maribda. The traveller was hospitably received by the sheik, who for many years has carried on a considerable trade with Timbuctu, where he has a brother. From here Dr. Lenz addressed to the Society a letter dated April the 13th in which he states that he intends to start for Timbuctu in a few days, and hopes to arrive there towards the end of May; thence he will endeavour to penetrate towards the Senegal.—A detailed report has come to hand from the traveller Hildebrandt, in which the latter describes his ascent of the Amber Mountains in North Madagascar, the highest point of which does not rise more than 600 metres above the level of the sea. The traveller, however, did not succeed in reaching the actual summit, named Assanáva, as his progress was cut short by an impassable abyss.—Dr. v. Möllendorff gave a description of his journey through the Chinese province of Chihli, and the meeting concluded with an address by Mr. Schlesinger on his residence among the Ainos of the Island of Yezo.

Geographical Society of Lyons.—June 3rd, 1880.—After an account by the Secretary-General of recent geographical events, M. Constant Morice read a memoir he had prepared on French Cochin-China, where he had resided for some time. He passed successively in review the different races, their customs and languages, civil and judicial organisation, the productions of the soil, and the trade of the colony. In concluding, M. Morice pointed out how important it was for French interests to establish commercial relations with Tongking as well as with the basin of the Red River (Song-koi), which was the great highway to China. M. Morice's paper will be published in an early number of the Society's 'Bulletin,' with an official plan of the town of Saigon, and a map of Cochin-China, based on information collected by Lieutenant Brossand de Carvigny, of the French Navy.

Geographical Society of Cairo.—June 11th, 1880: General STONE-PACHA, President, in the Chair.—Dr. Zuchinetti delivered an address on his travels in Central Africa, and gave an interesting account of the regions he had traversed on the way to Lado, in the provinces of Bahr el Ghazal, Bahr el Arab, Darfur, Kordofan, Khartum, &c. He afterwards furnished several particulars concerning the dress of the inhabitants, and the fauna and flora of the various countries which he had visited.—At this meeting our Associate, the Rev. C. T. Wilson, was elected an honorary member of the Society, in recognition of his services to geography on the Victoria Nyanza and in East Central Africa.

NEW BOOKS.

(By E. C. RYE, *Librarian* R.G.S.)

EUROPE.

Lasaulx, Arnold von.—Der Aetna. Nach den Manuscripten des verstorbenen Dr. Wolfgang Sartorius, Freiherrn von Waltershausen, herausgegeben, selbständig bearbeitet und vollendet. Erster Band. Reisebeschreibung Sartorius' und Geschichte der Eruptionen. Leipzig (Engelmann): 1880, 4to., pp. 371, map, pls. (*Dulau*: price 2*l.*)

Dr. Sartorius, who died in 1876, in addition to the Atlas of Mt. Etna published in 1845–1861, had collected a large amount of material elucidating the history and physics of that volcano, during his repeated visits since 1835. This is now carefully edited by Dr. Lasaulx, and illustrated by many very clearly executed outline plates of topographical interest, with woodcuts, and a photographic map of Etna and its lava-floods (scale 1 : 200,000). An account is given of the late Dr. Sartorius's various journeys to Sicily, with a history of the different eruptions, a bibliography referring to the mountain, and some previously unpublished matter referring to it.

Neyrat, Alexandre Stanislas.—L'Athos. Notes d'une Excursion à la presqu'île et à la Montagne des Moines. Paris (Plon): 1880, 16mo., pp. 216, photographs. (*Dulau*: price 3*s*. 6*d*.)

This historical and descriptive account of the monastery is chiefly noticeable for the photographic representations of scenery.

Persano, Ernesto.—Guida per i Sorgitori della Costa Occidentale d'Italia, qualli della Sardegna e della Sicilia. Milano (Hoepli): 1880, sq. 8vo., pp. 182. (*Dulau*: price 3*s*.)

Sailing directions for the ports of the west coast of Italy, and of Sardinia and Sicily.

ASIA.

Duncan, George.—Geography of India, comprising a descriptive outline of all India, and a detailed Geographical, Commercial, Social, and Political account of each of its provinces, with Historical notes. Tenth edition. Madras (Higginbotham) and London (Trübner): 1880, 16mo., pp. 182, pls. Price 12 annas (1*s*. 6*d*.).

This sketch appears to meet with universal acceptation in India as an educational primer. It is written up to date (including the gold discovery in the Wynaad), and gives both the correct and accepted orthography of native names.

Gordon, R.—Report on the Irrawaddy River. Part IV. The Hydraulic works connected with the Nawoon River, with Appendices. Rangoon (P. W. Secretariat Press): 1880, fo., pp. 141. (*Nutt*.)

This part (see *anteà*, p. 390) refers to the executed and projected works by which the whole drainage of the Myanoung plain is to be conducted to the Nawoon, so as to leave the greater part of the area available for cultivation. The upper watersheds, general characteristics, and discharges of the Nawoon are separately discussed, besides various professional matters.

Ujfalvy de Mezö-Kövesd, C. E. de.—Expédition scientifique française en Russie, en Sibérie et dans le Turkestan. Vol. V. Atlas des Étoffes, Bijoux, Aiguières, Émaux, etc., de l'Asie Centrale. Paris (Leroux): 1880, large 8vo., pp. 16, pls. i.–xxiv. (*Williams & Norgate*: price 15*s*. 4*d*.)

Intended to illustrate vol. ii. of the author's voyage to the ancient cities of Russian Turkistan, though in itself of no geographical interest.

——. Vol. VI. Atlas Archéologique des Antiquités Finno-Ougriennes et Altaïques de La Russie, de La Sibérie, et du Turkestan. Paris (Leroux): 1880, large 8vo., pp. viii., pls. i.–xxiii. (*Williams & Norgate*: price 9*s*. 8*d*.)

Definitely stated to be the last volume of the work (*anteà*, p. 324).

Walker, J. T.—Account of the Operations of the Great Trigonometrical Survey of India. Vol. V. Details of the Pendulum operations by Captains J. P. Basevi, R.E., and W. J. Heaviside, R.E., and of their Reduction. Dehra Dun and Calcutta: 1879, 4to., pp. lxii., 299, 259, 67, 14, and 126, maps, pls.

This volume (see Proc. R. G. S. 1879, p. 811, for vols. ii.–iv.) contains full details of the whole of the Pendulum observations up to date, in connection with the operations of the survey; also some valuable materials (by Major Herschel) for a history of pendulum science, with a bibliography of pendulums in connection with the figure of the earth. The maps show the Pendulum stations at Aden, Ismailia, Minicoy, and Moré; and the general pendulum operations are given on a map of India (scale 125 miles to the inch), a similar map showing the mean heights of compartments in English feet.

AFRICA.

Colville, H. E.—A Ride in Petticoats and Slippers. London (Sampson Low & Co.): 1880, sm. 8vo., pp. 328, map, pls. Price 12*s*.

The author, who fears an extension westwards of the French Algerian frontier into Morocco, which may ultimately prove of material injury to Great Britain, should Tangier be held by an unfriendly power, conceived the idea of a *reconnaissance* of the country between Fez and Oudjda by the valley of the Mooloou a, through which he expects that the first aggression will be made. This journey he successfully accomplished with his wife, disguised in the Moorish dress, and protected by letters from the Shereef. Rohlfs alone has penetrated as far eastwards from Fez as Tsarsa, about one-third of the way to the French frontier, and he appears to have somewhat exaggerated the difficulties of the route. Captain Colville did not visit Tsarsa, but passed through the two towns (or rather large villages) named Meknessa, to the north of it. The whole of this region is apparently in a chronic state of tribal war, the frequenters of markets, agriculturists, shepherds, and even some women and children being constantly armed. The Ghraiatsa people, and a mountain brigand named Gimbeeb, are the present aggressors. Armed with the Shereef's authority, however, and provided with a varying but sufficient escort, Captain Colville safely passed through the country of the Hooarah and Hallaff tribes, accomplishing his project with comparatively little trouble. He gives a sketch survey of the route (some 200 miles) from Fez to Oudjda, with the names of the various streams, valleys, mountains, and other physical features carefully put down, and positions fixed as accurately as possible under the circumstances, with the aid of a sextant and compass. The map of Morocco published by the French Dépôt de la Guerre and compiled by Captain Beaudouin from native information, is considered to be wonderfully accurate.

Paulitschke, Philipp.—Die geographische Erforschung des Afrikanischen Continents von den ältesten Zeiten bis auf unsere Tage. Ein Beitrag zur Geschichte der Erdkunde. Wien (Brockhausen & Bräuer): 1880, 8vo., pp. 331. (*Williams & Norgate*: price 6*s*.)

This second and augmented edition contains slight but useful references, chronologically arranged, of the different journeys made in various parts of Africa, from the earliest historic period to the present day. The voyages of discovery in ancient times and the middle ages are given in a general way; those from 1788 are subdivided under journeys from the north, west, south, and east, followed by those referring to the African islands. Copious notes are added, containing bibliographical references; and there is an index of names of travellers and historians referred to in the text.

AMERICA.

Bishop, Nathaniel H.—Four Months in a Sneak-Box. A Boat Voyage of 2600 miles down the Ohio and Mississippi rivers, and along the Gulf of Mexico. Edinburgh (Douglas): 1880, 8vo., pp. 322, maps, pls. Price 10*s*. 6*d*.

A sequel to the 'Voyage of the Paper Canoe' by the same author, narrating the incidents of his second solitary cruise (in a small vessel used by American sportsmen as a decoy punt) to the Gulf of Mexico, this time by the inland waters of the Ohio and Mississippi, starting from Pittsburgh. The five maps are specially drawn and engraved by the United States Coast and Geodetic Survey Bureau, and show the author's general route, the details from New Orleans to Cedar Keys, Florida, and the river and portage routes across Florida. Chapter vi. contains some pertinent observations on the status of physical geography in North America, and corrects some errors prevalent in the States as to the Mississippi, showing that the Missouri is the parent stream, and longer than the Amazon. Many interesting observations are also made on the surface alterations caused by subsidences and diversions in the courses of the larger rivers, some levels and supposed points of connection being shown to be absolutely incorrect. An account is given of Reelfoot Lake, created by a subsidence following the New Madrid earthquakes of 1811–1813, and possessing the peculiar flora and characteristics of the multitude of other swamp-lakes in the wilderness of the Lower Mississippi Valley.

Bouinais, A.—Guadeloupe: physique, politique, économique, précédée d'une notice historique. Première partie: notice historique et géographie physique. Paris (Delagrave; Challamel): 1880, 12mo., pp. 47. (*Williams & Norgate:* price 1*s.* 6*d.*)

The author, who has resided for four years in Guadeloupe, proposes to complete his sketch in two similar parts, with a special map. He has been struck by the errors prevalent even in special works referring to the French colonies.

GENERAL.

Brown, Richard.—Notes on the Northern Atlantic, for the use of Travellers. London (Sampson Low & Co.): 1880, sm. post 8vo., pp. 142, map. Price 4*s.* 6*d.*

An unpretentious account of the navigation, physics, and fisheries of the Northern Atlantic, compiled with the object of interesting passengers to the United States.

Vogel, Charles.—Le Monde Terrestre au point actuel de la Civilisation. Nouveau Précis de Géographie Comparée, Descriptive, Politique, et Commerciale, avec une Introduction, l'indication des sources et cartes, et un Répertoire alphabétique. Tome Deuxième, comprenant les Iles-Britanniques, le Nord Scandinave, et l'Europe Centrale, avec un aperçu complémentaire de la situation de chaque pays au commencement de l'année 1880. Paris (Reinwald): 1880, large 8vo., pp. 1212. (*Williams & Norgate:* price 15*s.*)

This work, too large for an outline, and not sufficiently exhaustive for referential purposes, is to be completed in a third vol., divided into three sections. Its political and statistical aspects appear to be the most noteworthy.

NEW MAPS.

(By J. Coles, *Map Curator* R.G.S.)

EUROPE.

Austrian Government.—Specialkarte der Oesterreichsch-Ungarischen Monarchie. Scale 1 : 75,000 or 1 geographical mile to an inch. 1880. Price of each sheet 1*s.* 4*d.* (*Dulau.*)

The following sheets are just published:—Zone 2, Column X., Bodenbach und Tetschen. Zone 2, Column XIII., Harrachsdorf. Zone 3, Column XIV., Trautenau und Politz. Zone 3, Column XV., Schönau bei Bhm. Braunau. Zone 4, Column XII., Juncbunziau und Liban. Zone 5, Column XV., Senftenberg. Zone 6, Column XIII., Caslau und Chrudim. Zone 7, Column XVII., Weiskirchen in Mähren. Zone 7, Column XIX., Teschen, Mistek und Jablunkau. Zone 8, Column XII., Kamenitz. Zone 9, Column XI., Wittingau und Moldauthein. Zone 9, Column XVII., Ung Hradisch und Ung Brod.

Hartleben.—Karte der Donau von ihrem Ursprunge bis an die Mündung. Scale 1 : 300,000 or 4·1 geographical miles to an inch. Hartleben, Vienna. 16 sections on 9 sheets. Price 4*s.* (*Dulau.*)

Kiepert, H.—Carte de l'Épire et de la Thessalie, dressée par H. Kiepert, 1871. Berlin chez D. Reimer. Nouvelle édition corrigée en 1880. Scale 1 : 500,000 or 6·8 geographical miles to an inch. Price 4*s.* (*Dulau.*)

This map, which is accompanied by an explanatory sheet of letterpress, shows the existing frontier of the Kingdom of Greece, as well as the rectifications proposed at the Berlin Congress, July 1878, that of the Turkish Government, March 1879, the English proposition, June 1879, the original and modified proposals of Greece in October and December 1879, the modified Turkish proposals, November 1879, and those of the French Government in December 1879; it also shows the routes of Leake, Gell and Dodwell, Pouqueville, Ussing, Nicolaïdy, and Barth. This map has been carefully corrected up to date from the reconnaissances of the officers of the Austrian Engineers and those of MM. Gorceix, Carapanos, and M. de Gubernatis, and cannot fail to be of interest at the present moment, when so much attention is turned to this portion of Europe. Scales of the measures of all the great Powers are given, and the elevations are shown by contour lines.

Leuzinger, R.—Karte d. Kantons Aargau. Scale 1 : 200,000 or 2·7 geographical miles to an inch. Aarau, Lauerländer. 2nd edition. Price 1*s*. (*Dulau.*)

Schulz, R. A.—Der Schneeberg u. die Raxalpe nebst der Schneealpe und Maria-Zell, von R. A. Schulz. Scale 1 : 72,000 or 1·01 inch to a geographical mile. Artaria & Co., Vienna, 1880. Price 3*s*. (*Dulau.*)

Service Vicinal.—Carte de France dressée par le Service Vicinal, par ordre du Ministre de l'Intérieur. Scale 1 : 100,000 or 1·3 geographical miles to an inch. Erhard, Paris, 1880. Price of each sheet, 8*d*. (*Dulau.*)

The following sheets are just published:—XVIII. 9 (St. Quentin, Péronne), 10 (Chauny), 11 (Soissons, Compiègne, Villers-Cotterêts), 12 (Crépy-en-Valois), 13 (Coulommiers, Meaux). XIX. 9 (Guise), 10 (Laon), 11 (Fismes), 12 (Château-Thierry), 13 (Montmirail). XX. 9 (Vervins), 10 (Château-Porcien.)

ORDNANCE SURVEY MAPS.

1-inch—General Maps:—

Scotland, Nos. 72, 108, 114, in outline and with contours, at 1*s*. 9*d*.
Ireland: Nos. 187, 188, 194, with hills, at 1*s*.

6-inch—County Maps:—

England and Wales: Denbigh: Nos. 6, 7, 11, 24, 26, 34, 42, 44 and 46 (on one), at 2*s*. 6*d*.; Nos. 23, 38, 43 and 45 (on one), at 2*s*. Essex: Nos. 1, 6, 86, at 2*s*. Flint: No. 7 and No. 8 Denbigh (on one), 2*s*. Surrey: No. 3, 2*s*. 6*d*. Sussex: Nos. 11, 22, 34, 36, 47, 48, 49, 62, at 2*s*. 6*d*.

Scotland: Argyllshire, with part of the Island of Mull, Nos. 39, 53 at 2*s*. 6*d*.; 109, 2*s*. Island of Muck, No. 74, 2*s*. Inverness: No. 48 engraved on 47, 2*s*. 6*d*.; Island of Skye, Nos. 9, 22 at 2*s*. 6*d*., Nos. 6, 8, 10, 14, 42 at 2*s*., Nos. 32 and 32A on one sheet, 2*s*.; Islands of North Uist and Harris, Hebrides, No. 26, 2*s*. Orkney and Shetland Islands, No. 26, 2*s*.

Ireland: Cavan: Nos. 5, 10, 12, 13, 18 (revised), at 2*s*.; No. 7 (revised), 2*s*. 6*d*.

25-inch—Parish Maps:—

England and Wales: Berks: Brightwaltham, 17 sheets at 2*s*. 6*d*., Area Book 1*s*. 6*d*.; Aldermaston and ditto detached, 13 sheets at 2*s*. 6*d*., 2 at 4*s*., Area Book 1*s*.; Avington, 7 sheets at 2*s*. 6*d*., Area Book 1*s*.; Brimpton, 5 sheets at 2*s*. 6*d*., 2 at 4*s*., Area Book 1*s*.; Bucklebury, 16 sheets at 2*s*. 6*d*., Area Book 2*s*.; Hampstead Norris, 16 sheets at 2*s*. 6*d*., Area Book 1*s*. 6*d*.; Inkpen and ditto detached, in part, 9 sheets at 2*s*. 6*d*., Area Book 1*s*.; Shalbourne and ditto detached, in part, 11 sheets at 2*s*. 6*d*., 1 at 4*s*., Area Book 1*s*.; West Woodhay, 6 sheets at 2*s*. 6*d*., Area Book 1*s*.; Woolhampton, 2 sheets at 2*s*. 6*d*., 2 at 4*s*., Area Book 1*s*.; Kentbury and ditto detached, 17 sheets at 2*s* 6*d*., 1 at 4*s*., Area Book 1*s*. 6*d*.; Leckhampton, 6 sheets at 2*s*. 6*d*., Area Book 1*s*.; Frilsham, in completion, 2 sheets at 2*s*. 6*d*.; Wasing, in completion, 1 sheet, 4*s*.; Beenham, in completion, 1 sheet, 2*s*. 6*d*.; Yattendon, in completion, 1 sheet at 2*s*. 6*d*.; Beedon, in completion, 3 sheets at 2*s*. 6*d*.; Chaddleworth, 10 sheets at 2*s*. 6*d*., Area Book 1*s*.; Peasemore, 7 sheets at 2*s*. 6*d*., Area Book 1*s*.; East Garston, in completion, 1 sheet at 2*s*. 6*d*. Brecknock: Llangallwg, in part, 11 sheets at 2*s*. 6*d*., 2 at 4*s*., 1 at 6*s*., Area Book 2*s*.; Llangynidr, in part, 14 sheets at 2*s*. 6*d*., 2 at 4*s*., 1 at

6*s.*, Area Book 2*s.*; Llanelly, in part, 3 sheets at 2*s.* 6*d.*, 1 at 4*s.*, 1 at 6*s.*, Area Book 2*s.* Bucks: Edlesborough, and ditto detached, in part, 16 sheets at 2*s.* 6*d.*, Area Book 1*s.* 6*d.*; Ivinghoe, and ditto detached, in part, 17 sheets at 2*s.* 6*d.*, Area Book 1*s.* 6*d.*; Marsworth, in part, 5 sheets at 2*s.* 6*d.*, Area Book 1*s.*; Pitstone, and ditto detached, in part, 13 sheets at 2*s.* 6*d.*, Area Book 1*s.* Caermarthen: Llangennech, in 8 sheets, 6 at 2*s.* 6*d.*, 2 at 4*s.*, Area Book 1*s.* 6*d.*; Llannon, in 25 sheets at 2*s.* 6*d.*, Area Book 4*s.*; Pen-tre, 29 sheets at 2*s.* 6*d.*, 7 at 4*s.*, 1 at 5*s.*, 1 at 6*s.*, Area Book 3*s.*; Kidwely, in part, 10 sheets at 2*s.* 6*d.*, 3 at 4*s.*, Area Book 2*s.*; Llanarthne, in part, 7 sheets at 2*s.* 6*d.*, Area Book 1*s.* 6*d.*; Llanddarog, in part, 5 sheets at 2*s.* 6*d.*, Area Book 1*s.*; Llanelly, 29 sheets at 2*s.* 6*d.*, 5 at 4*s.*, 1 at 5*s.*, 1 at 6*s.*, 1 at 8*s.*; Llandybie, in completion, 10 sheets at 2*s.* 6*d.*, 1 at 4*s.*; Llangyndeyrn, 14 sheets at 2*s.* 6*d.*, Area Book 2*s.* 6*d.* Cornwall: Constantine, 20 sheets at 2*s.* 6*d.*, Area Book 3*s.* 6*d.*; Mabe, 8 sheets at 2*s.* 6*d.*, Area Book 1*s.* 6*d.*; Wendron, part of, 30 sheets at 2*s.* 6*d.*, Area Book 5*s.*; Camborne, 17 sheets at 2*s.* 6*d.*, Area Book 3*s.* 6*d.*; Illogan, in part, 17 sheets at 2*s.* 6*d.*, 1 at 4*s.*, Area Book 4*s.* Derby: Ashover, in part, 19 sheets at 2*s.* 6*d.*, 1 at 4*s.*, Area Book 3*s.*; Darley, 13 sheets at 2*s.* 6*d.*, 4 at 4*s.*, Area Book 2*s.* 6*d.*; Hartington, 42 sheets at 2*s.* 6*d.*, 1 at 4*s.*, 1 at 6*s.*, Area Book 3*s.* 6*d.*; North Wingfield, in completion, 4 sheets at 2*s.* 6*d.*; South Normanton, 3 sheets at 2*s.* 6*d.*, 3 at 4*s.*, Area Book 1*s.*; Youlgreave, 22 sheets at 2*s.* 6*d.*, 2 at 4*s.*, Area Book 4*s.*; Chesterfield, in completion, 2 sheets at 2*s.* 6*d.*; Wingerworth, in completion, 4 sheets at 2*s.* 6*d.*; Blackwell, in addition, 2 sheets at 2*s.* 6*d.*; Tibshelf, in completion, 1 sheet 2*s.* 6*d.*; Parwick, 8 sheets at 2*s.* 6*d.*, Area Book 1*s.*; Ashborne (det. No. 1), in part, 6 sheets at 2*s.* 6*d.*, Area Book 1*s.*; Crick (det.), 3 sheets at 2*s.* 6*d.*, 2 at 4*s.* Glamorgan: Michaelston-super-Ely, 3 sheets at 2*s.* 6*d.*, Area Book 1*s.*; St. Georges, in completion, 1 sheet at 2*s.* 6*d.*; St. Lythans, in completion, 1 sheet at 2*s.* 6*d.*; St. Nicholas, in completion, 1 sheet at 2*s.* 6*d.*; Cheriton, in completion, 4 sheets at 2*s.* 6*d.*; Llanmadog, in completion, 2 sheets at 2*s.* 6*d.*; Llanrhidian and Cefn-y-Bryn, in completion, 7 sheets at 2*s.* 6*d.*, 1 at 4*s.*, 1 at 5*s.* Gloucester: Coates and ditto detached, in completion, 2 sheets at 2*s.* 6*d.*; Fairford, 9 sheets at 2*s.* 6*d.*, 1 at 4*s.*, Area Book 1*s.*; Down Ampney, in completion, 5 sheets at 2*s.* 6*d.*; Kempsford, in completion, 2 sheets at 2*s.* 6*d.*; South Cerney, in completion, 2 sheets at 2*s.* 6*d.* Herts: Bishop's Stortford, 6 sheets at 2*s.* 6*d.*, 2 at 5*s.*, Area Book 1*s.*; Thorley, 6 sheets at 2*s.* 6*d.*, 1 at 5*s.*, Area Book 1*s.*; St. Michael, 3 additional sheets, 2*s.* 6*d.*, 4*s.*, and 5*s.*; St. Peter and St. Alban, 3 additional sheets, 2*s.* 6*d.*, 4*s.*, and 5*s.*; Sandridge, 2 additional sheets, 2*s.* 6*d.* and 4*s.* Monmouth: Mynyddislwyn, in part, 27 sheets at 2*s.* 6*d.*, 2 at 4*s.*, Area Book 4*s.*; Aberystruth, in part, 14 sheets at 2*s.* 6*d.*, 6 at 4*s.*, 1 at 5*s.*, 1 at 6*s.*, Area Book 2*s*; Machen, 7 sheets at 2*s.* 6*d.*, 1 at 4*s.*, Area Book 2*s.*; Bedwelty, in completion, 11 sheets at 2*s.* 6*d.*, 4 at 4*s.*, 1 at 5*s.*, 1 at 6*s.*; Llanhilleth, 7 sheets at 2*s.* 6*d.*, 1 at 4*s.*; Bedwas, 11 sheets at 2*s.* 6*d.*, 1 at 4*s.*, Area Book 2*s.* Notts: Mansfield Woodhouse, 11 sheets at 2*s.* 6*d.*, 1 at 4*s.*, 1 at 7*s.*, Area Book 1*s.* 6*d.*; Pinxton, in 2 sheets, 1 at 2*s.* 6*d.*, 1 at 4*s.*, Area Book 1*s.*; Fullwood, 3 sheets at 2*s.* 6*d.*, 1 at 4*s.*, Area Book 1*s.*; Lindhurst, in part, 4 sheets at 2*s.* 6*d.*, Area Book 1*s.*; Sutton-in-Ashfield, in completion, 3 sheets at 2*s.* 6*d.*, 1 at 4*s.*; Mansfield, in addition, 5 sheets at 2*s.* 6*d.*; Kirkby-in-Ashfield, in completion, 1 sheet at 2*s.* 6*d.*, 2 at 4*s.* Oxford: Headington, Open Magdalen, Open Brasenose and Elder Stubbs (part of), 4 sheets at 2*s.* 6*d.*, 1 at 4*s.*, 1 at 13*s.*, Area Book 1*s.*; Stow Wood (part of), 4 sheets at 2*s.* 6*d.*, Area Book 1*s.*; Beckley, in addition, 3 sheets at 2*s.* 6*d.*; Cowley, in addition, 1 sheet at 2*s.* 6*d.*, 1 at 4*s.*. Staffordshire: Alstonfield (part of), 39 sheets at 2*s.* 6*d.*, Area Book 5*s.*; Burslem, 10 sheets at 2*s.* 6*d.*, Area Book 1*s.* 6*d.*; Horton, 14 sheets at 2*s.* 6*d.*, Area Book 2*s.* 6*d.*; Keele, 7 sheets at 2*s.* 6*d.*, Area Book 1*s.*; Leek (part of), 52 sheets at 2*s.* 6*d.*, 1 at 5*s.*, 3 at 4*s.*, Area Book 5*s.* 6*d.*; Mayfield (detached, No. 1), 6 sheets at 2*s.* 6*d.*, Area Book 1*s.*; Newcastle-under-Lyme, 3 sheets at 2*s.* 6*d.*, Area Book 1*s.*; Norton-in-the-Moors, 13 sheets at 2*s.* 6*d.*, Area Book 2*s.* 6*d.*; Wolstanton, 26 sheets at 2*s.* 6*d.*, Area Book 3*s.* 6*d.*; Audley, in completion, 8 sheets at 2*s.* 6*d.*; Sheen, 11 sheets at 2*s.* 6*d.*, Area Book 1*s.* 6*d.*; Cheddington, 17 sheets at 2*s.* 6*d.*, Area Book 2*s.* 6*d.*; Dilhorne, 10 sheets at 2*s.* 6*d.*, 3 at 4*s.*, Area Book 1*s.* 6*d.*; Ipstones, in part, 10 sheets at 2*s.* 6*d.*, Area Book 2*s.*; Kingsley, in part, 9 sheets at 2*s.* 6*d.*, Area Book 2*s.*; Stoke-upon-Trent, 27 sheets at 2*s.* 6*d.*, Area Book 2*s.* 6*d.*; Cheadle, in part, 9 sheets at 2*s.* 6*d.*, 4 at 4*s.*, Area Book 2*s.* 6*d.*; Trentham, and ditto detached, 9 sheets at 2*s.* 6*d.*, Area Book 2*s.* 6*d.*; Grindon, in part, 5 sheets at 2*s.* 6*d.*, Area Book 1*s.* 6*d.*; Wetton, in part, 6 sheets at 2*s.* 6*d.*; Stafford Caverswall, 13 sheets at 2*s.* 6*d.*, 1 at 4*s.*, Area Book 1*s.* 6*d.*; Cheadle, detached, 1 sheet at 2*s.* 6*d.*, Area Book 1*s.*; Draycott-in-the-Moors, in part, 3 sheets at 2*s.* 6*d.*, 3 at 4*s.*, Area Book 1*s.* 6*d.* Wilts: Crudwell, 13 sheets at 2*s.* 6*d.*, 1 at 4*s.*, Area Book 1*s.*; Hankerton, 8 sheets at 2*s.* 6*d.*, Area Book 1*s.*; Blunsdon St. Andrew, in completion, 2 sheets at 2*s.* 6*d.*; Cricklade St. Sampson, in completion, 1 sheet at 2*s.* 6*d.*; Kemble, in completion, 2 sheets at 2*s.* 6*d.*; Latton, in completion, 2 sheets at 2*s.* 6*d.*; Marston Meysey, in completion, 3 sheets at 2*s.* 6*d.*; Minety, in completion, 3 sheets at 2*s.* 6*d.*; Bulford, 6 sheets at 2*s.* 6*d.*, 3 at 4*s.*, Area Book 1*s.*; Cholderton, 5 sheets at 2*s.* 6*d.*, Area Book 1*s.*; Durrington, and ditto detached, 4 sheets at 2*s.* 6*d.*, 2 at 4*s.*, Area Book 1*s.*; Purton, in completion, 8 sheets at 2*s.* 6*d.*, 1 at 4*s.*; Amesbury, in addition, 4 sheets at 2*s.* 6*d.*, 2 at 4*s.*; Martin, in completion, 5 sheets at 2*s.* 6*d.*; Newton Toney, in completion, 2 sheets at 2*s.* 6*d.*; Toyd Farm, with Allenford, in completion, 1 sheet at 2*s.* 6*d.*

SCOTLAND: Argyllshire: Jura, 17 sheets at 2*s.* 6*d.*, Area Book 1*s.* 6*d.*; Tiree (Islands of Tiree Soa, &c.), 44 sheets at 2*s.* 6*d.*, Area Book 2*s.* 6*d.* Orkney and Shetland Islands, Llunnasting, 5 sheets at 2*s.* 6*d.*, Area Book 1*s.*

Town Plans—5-feet Scale:—

SCOTLAND: Edinburgh, 5 sheets at 2*s.*, revised.

10-feet Scale:—

ENGLAND AND WALES: Caermarthen: Llanelly, in part, 5 sheets at 2*s.* Glamorgan: Swansea, in completion, 16 sheets at 2*s.* Hants: Portsmouth, LXXXIII., 6–14 and 15 on one, 16 revised, 2*s.* 6*d.* each. Herts: St. Albans, in completion, 2 sheets at 2*s.*; Bishop's Stortford, 13 sheets at 2*s.* Lancashire: Oldham, in part, 98 sheets at 2*s.* (Total number of sheets 167.) Staffordshire: Hanley (the Potteries), in addition, 9 sheets at 2*s.*; Tunstall (the Potteries), in completion, 5 sheets at 2*s.*; Leek (the Potteries), in completion, 4 sheets at 2*s.* (*Stanford, agent.*)

ASIA.

Indian Government Surveys.—Great Trigonometrical Survey of India. Preliminary Chart of the Eastern Frontier Series. Season 1877–78. Scale 4 miles to 1 inch. With Addendum to Chart for 1876–77 on the same sheet. Preliminary Chart of Secondary Triangulation, executed by the Burmah Party. Season 1878–79. 1. Thayetmyo, viâ Prome, Myanaung, and Bassein, towards Cape Negrais; 2. Pegu, Rangoon, and Coast. Preliminary Chart of the Madras Coast Series. Season 1878–79. Pondicherry and Porto Novo. Southern continuation of the Preliminary Chart of the Kumaon and Garhwal Series. Season 1871–72. Northern Continuation of the same. Seasons 1864 to 1878. On 2 sheets.—Bengal. Lower Provinces Revenue Survey. District Fureedpoor [Faridpur]. Scale 1 inch to 1 mile; on 13 sheets. Sheet 13. Lower Provinces Revenue Survey. District Rajshahee. Scale 1 inch to 1 mile; on 11 sheets. Sheets 6, 7, 8, 9, 10.—North-West Provinces. Dehra Dun and Siwaliks. 1873–76. Scale 1 inch to 1 mile; on 3 sheets. Dehra Municipality and Cantonment. Surveyed in 1875–76. Photozincographed in 1880. Scale 12 inches to 1 mile; on 2 sheets.—Punjab. Simla and Kalka Road Survey. 1877–78. Scale 6 inches to 1 mile. Sheets 2B, 3B, 4B, 5B, 6B; 3C, 4C, 5C, 6C, 7C; 5D and 6D on 1 sheet, 7D, 8D, 9D.—Rajputana. Fort and City of Chitor. Surveyed and drawn under the Superintendence of Captain C. Strahan, C.E., Deputy-Superintendent Topographical Survey, 1877–78. Scale 6 inches to 1 mile; on 2 sheets. City of Oodeypore and Environs, Rajputana. 1877–78–79. Scale 12 inches to 1 mile; on 6 sheets. Luni River Survey, [Jodhpur] Jodhpore Native State, Rajputana. 1878–79. Scale 1 inch to 1 mile; on 3 sheets. Gwalior and Central India Topographical Survey. Portion of Jodhpore. 1878–79. Scale 1 inch to 1 mile. Sheet 93. Plan of the Pachpadra Salt Pits, Jodhpore Native State, Rajputana. 1878–79. Scale 4 inches to 1 mile; on 2 sheets.—Central Provinces. District Balaghat. 1861 to 1864, and 1874 to 1876. Scale 4 miles to 1 inch. Ganjam and Orissa Topographical Survey. Old Series, 1864–65. Parts of District Bilaspur and of Korba Estate. Sheets 85 and 87 on 1 sheet. Scale 2 miles to 1 inch.—Mysore. Mysore Topographical Survey. 1878–79. Parts of Tumkar and Kolar Districts. Scale 1 mile to 1 inch. Sheets 36, 39.—Assam. Assam, 1879. In 9 sheets. Scale 8 miles to 1 inch. Sheets 5, 6, containing parts of Districts Kamrup, Darrang, Nowgong, Sylhet, Cachar, Khasi, Jaintia and Naga Hills, and Manipur. Khasi, Garo, and Naga Hills Topographical Survey. 1873–74. Scale 2 miles to 1 inch. Sheets 107, third edition, 111, 125, 126, 129. North Brahmaputra Exploration Survey. 1877–78. Part of the Miri Hills. Scale 4 miles to 1 inch. Sheets 161, 162, 163, 164, 165, 168, 170, 171, all on 1 sheet. Part of the Mishmi Hills, North-East Frontier, Assam. Surveyed by Captain R. G. Woodthorpe, R.E., and Mr. W. Robert. 1877–78. Scale 4 miles to 1 inch. Degree Sheets 20, 21, 24, 25, all on 1 sheet.—Guzerat. Sheet No. 6 of Guzerat. Sheet No. 7 of Guzerat. Parts of the Ahmedabad and Kaira Collectorates of the Gaekwar's Territory, and of the Mahi Kanta States. 1877–78. Scale 1 inch to 1 mile. Guzerat. Sheet 29, Section 1. Season 1876–77. Parts of Anand and Borsad Talukas of the Kaira Collectorate, &c. Scale 2 inches to 1 mile.—Kattywar. Sheet No. 41 and part of Sheet No. 30 of Kattywar. Part of Sorath. 1870, 1871–72, 1877–78. Scale 1 inch to 1 mile. Sheet No. 51 of Kattywar. Part of Hillar. 1878–79. Sheet No. 52 of Kattywar. Part of Hillar. 1878–79. Sheet No. 60 of Kattywar. Parts of Hallar and Barda. 1878–79.—Indo-Chinese Frontier. Hundes, or Narikhorsum, and Monyul, with parts of the surrounding Districts. Scale 8 miles to 1 inch. Compiled from Strachey's Map of Hundes, 1851; Trans-Himalayan Explorations by the Pundits, &c.; and Topographical Sketches and Triangulation Charts, by Messrs. Ryall and Kinney, 1877–78. On 2 sheets.—North-Western Frontier of India. Sketch of the Countries between Hindustan and the Caspian Sea, with Additions to April 1879. Scale 64 miles to 1 inch. Seat of War in Northern Afghanistan; taken principally from Surveys and Reconnaissances by Officers of the Survey of India, 1878–80. Scale 4 miles to 1 inch. Map of the Country between Kalat-i-Gilzai and Ghazni. In continuation of the Map of the Seat of War in Northern Afghanistan. (*Stanford, agent.*)

NOTE.—The names in brackets [ ] are authorised spellings.

AFRICA.

arbier, J. V.—Carte de l'Afrique physique suivant la projection de Flamsteed. Scale 1: 20,000,000, or 273·9 geographical miles to an inch. J. V. Barbier, Nancy. Price 2*s*. (*Dulau.*)

etermann's 'Geographische Mittheilungen.'—Verminck's Expedition nach den Nigerquellen unter Zweifel u. Moustier, 1879. Nach der Originalkarte der Reisenden und anderen Quellen gezeichnet von B. Hassenstein. Scale 1: 2,000,000 or 27 geographical miles to an inch. Petermann's 'Geographische Mittheilungen,' Jahrgang 1880, Taf. 12. Justus Perthes, Gotha. (*Dulau.*)

AMERICA.

Petermann's 'Geographische Mittheilungen.'—Tracé einer Eisenb Mejillones nach La Paz in Bolivia, aufgenommen von Ingenieur Hugo A. De Scale 1 : 2,000,000 or 27 geographical miles to an inch. Petermann's 'G phische Mittheilungen,' Jahrgang 1880, Taf. 13. Justus Perthes, (*Dulau.*)

CHARTS.

Admiralty.—Charts published by the Hydrographic Department, Admir May and June 1880.

No.			Inches.	
647	m	=	1·8	South America, west coast:—Coronel, Lota, and C bays. Price 1*s.* 6*d.*
998	m	=	0·13	Siam gulf:—Pulo Kapas to Lacon roads. (Plans, S roads, Patani roads, Great Redang harbour, Tri Price 2*s.* 6*d.*
1363	m	=	0·25	Africa, west coast:—Sherbro island to cape Me (Plans, Gallinas river, Cape Mount river.) Price
2828	m m	= =	3·0 12·0	Newfoundland:—Duck island to Ship rock shoal, in ing port Basque. Price 1*s.* 6*d.*
1612	m	=	various.	Adriatic sea:—Ports and anchorages in Dalmatia Trau; Spalato; Makarska; S. Giorgio; Verboska Gelsa. Almissa road. Spalmadori channel. Citta chia bay. Price 1*s.* 6*d.*
15	m m	= =	3·5 6·0	South America, west coast, Patagonia:—Molyneux Portland bay. Price 1*s.*
36	m	=	3·25	England, Bristol channel:—Lundy island.
475	d	=	2·25	Australia:—North-west coast of Australia between th parallels of 10° 8′ and 21° S., with the off-lying isl and reefs.

No. 241. Plan added, Tolmeitah, Marsa Sousah. No. 2600. Plan added, A island (Bird islands). (*J. D. Potter, agent.*)

CHARTS CANCELLED.

No.		Cancelled by	No.
1286	Plan on this sheet, Coronel and Lota bays	New plan, Coronel, Lota, and Colcura bays	647
1614	Spalatro strait.		
998	Pulo Kapas to cape Patani ..	New chart, Pulo Kapas to Lacon roads	998
1363	Sherbro island to cape Mesurado	New chart, Sherbro island to cape Mesurado	1363
2828	Port Basque	New plan, Duck island to Ship rock shoal	2828
1612	Port Spalatro	New sheet, ports and anchorages in Dalmatia	1612
1615	Lesina channel		
1618	Port S. Giorgio		
15	Molyneux sound	New plan, Molyneux sound, Portland bay	15
36	Lundy island	New plan, Lundy island ..	36

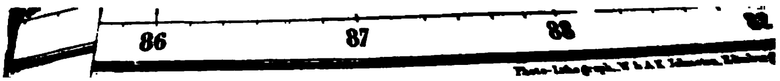

Photo-Lithograph W & A K Johnston, Edinburgh

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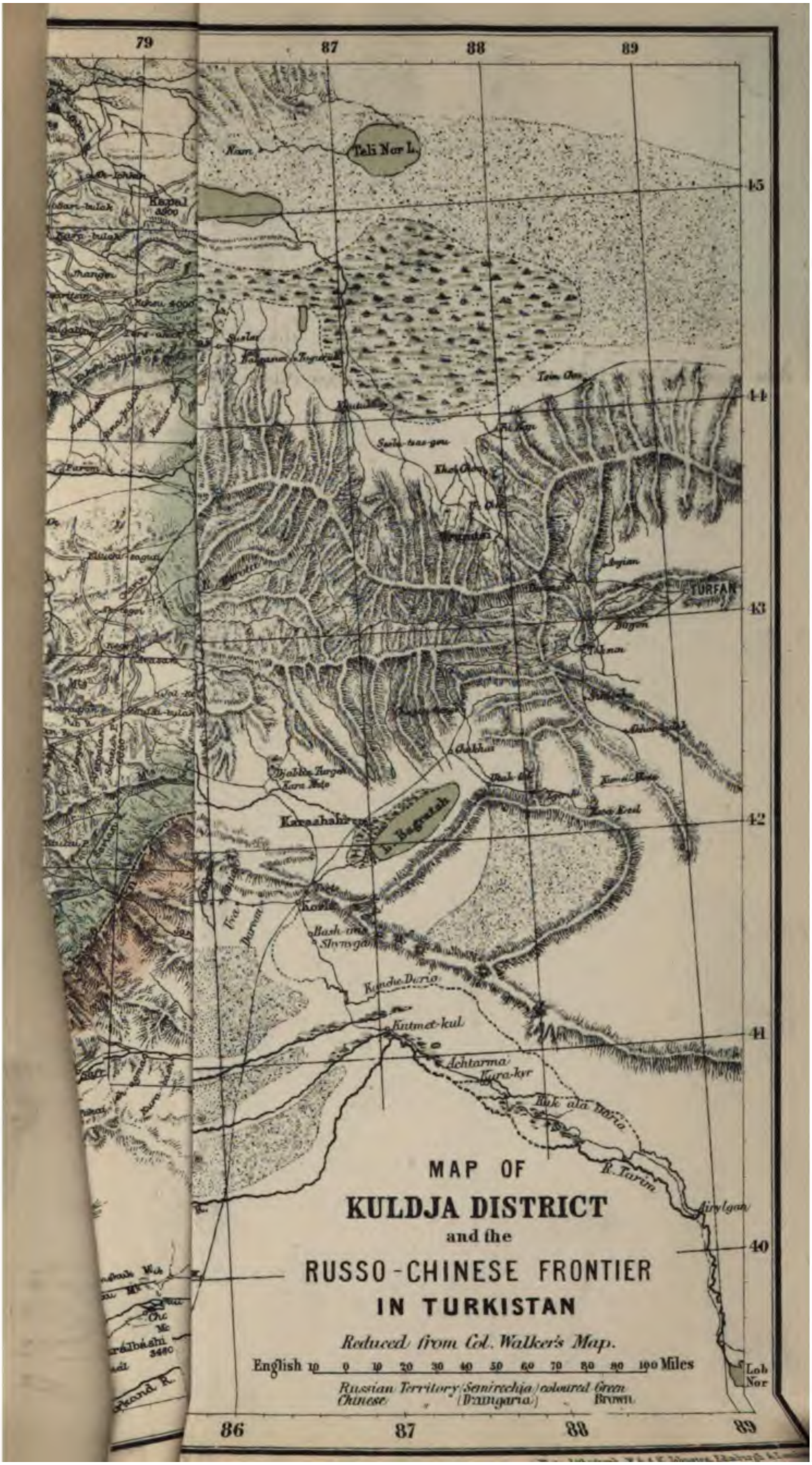

MAP OF

KULDJA DISTRICT

and the

RUSSO-CHINESE FRONTIER

IN TURKISTAN

Reduced from Col. Walker's Map.

English 10 0 10 20 30 40 50 60 70 80 90 100 Miles

Russian Territory (Semirechja) coloured Green
Chinese " (Dzungaria) " Brown

[illegible]

PROCEEDINGS

OF THE

ROYAL GEOGRAPHICAL SOCIETY

AND MONTHLY RECORD OF GEOGRAPHY.

The Highway from the Indus to Candahar.

By Sir RICHARD TEMPLE, Bart., G.C.S.I., C.I.E., D.C.L.

(A Lecture delivered at the Evening Meeting, June 14th, 1880.)

Map, p. 592.

SIR RICHARD TEMPLE spoke as follows :—

I am supposed at this moment to begin reading to you a paper on the Highway from the Indus to Candahar; but I am only to give you orally what I hope will be found to be a popular explanation of the maps, and of the pictorial representations which are hung up on the screen behind me and before you. The large map in the corner is the standard map of Afghanistan and Central Asia, with which all members of this Society are familiar. The map immediately below it is a new map which has been prepared specially by the draughtsman of the Society, Mr. Turner, for this occasion; and in several respects it contains geographical particulars which, although they have been exhibited in India, have never been exhibited before any audience in England.* The pictorial illustrations have been prepared by my brother, Lieutenant George Temple of the Navy, a gentleman who has read papers with similar illustrations in this very lecture room. These illustrations have been prepared from my own original sketches and under my own supervision, and I can guarantee their correctness. The region on which I am about to dilate briefly is, I do not disguise from you, fraught with much political interest; but politics constitute a theme upon which I am absolutely precluded from entering at the present moment. But although all of you are, ladies and gentlemen, geographers first, I dare say you are sympathetic with all the human interest which attaches to the scenes illustrated on this screen. These are scenes where British soldiers and British people have not only bled, suffered, and endured, but are still bleeding, still suffering, still enduring. This is a region which many men contemplate with pride, considering the honours they have already won, and, with hope, regarding the distinction which they may still acquire; but it is also a region which many English parents meditate upon with anxiety, on account of their gallant sons or relatives who are serving their country. It is a region, also, to which many weeping widows and bereaved relations will look back with a lifelong regret. Therefore it is a region fraught with human interest—an interest which will be ever cherished by members of this Society.

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* The map accompanying this number at p. 592 is a reduction, with additions from recent surveys, of the map alluded to by Sir Richard, and the engravings (by Lieut G. T. Temple) are also reductions of the pictorial illustrations exhibited by the lecturer.—ED.

Now, ladies and gentlemen, I must first ask you to bear in mind generally the region to which our expedition relates. If you will kindly look at the general map, on your extreme left you will see the country of Afghanistan, the valley of the Indus, Kurrachee (Karáchi), the Punjab, Sukkur, Candahar, Herat, Ghuzni, and Kabul; and up at the top you will see the regions of Central Asia. Now, then, I presume you know pretty well where you are.

I shall ask you next to look at the map immediately below on your left, which has been prepared for this occasion. This map relates to the country between the Indus and the Argandab; that is to say, between the town of Sukkur on the Indus and the town of Candahar on the Argandab, a distance of over 400 miles. It is divided for the purposes of this exposition into four divisions, to which I must ask your particular attention.

First, there is the country below the hills; secondly, the country within the hills; thirdly, the valley of Pishin and the Khoja Amran range, which is the boundary between the British territory and Southern Afghanistan; fourthly, the country between the Khoja Amran range and Candahar. Now, to each of these divisions I shall have to ask your attention separately, and in detail.

First, then, as regards the country below the hills. Now, let us begin with the position of Sukkur on the Indus. Near Sukkur there runs up a low range of hills from the south-east towards Sukkur. That range is a remarkable geographical feature, for it determines the course of the Lower Indus. It settles the question whether the Indus shall run through Sind, converting it into a lesser Egypt, or whether the Indus shall run towards the east to the deserts that skirt the western parts of India. Now, the Indus passes by the town of Kusmore, a little above Sukkur. From Kusmore down to Sukkur there is a long line of embankments which constitute a monument of British enterprise and science, and which form one of the largest series of embankments in the world, Holland not excepted. In the neighbourhood of these embankments, that is, under the lee of the protective line, are canals, villages and towns, railway lines, military roads, marts of trade, all nestling in comparative security. But sometimes the Indus breaks through those embankments. The year before last it swept the country you see coloured green on the map, and placed it all under water. Traffic for the time was suspended, the roads were submerged, and the whole country was the scene of temporary devastation. Now, these are dangers from which no human skill or foresight can guard us. We hope to make these embankments more safe from time to time; but the Indus constitutes a source of permanent danger. Now, through this piece of country that is coloured green on the map, there runs the line of the new railway from a point near Sukkur to Candahar, and thus I bring you the first 50 miles of your journey of 400 miles and upwards towards Candahar.

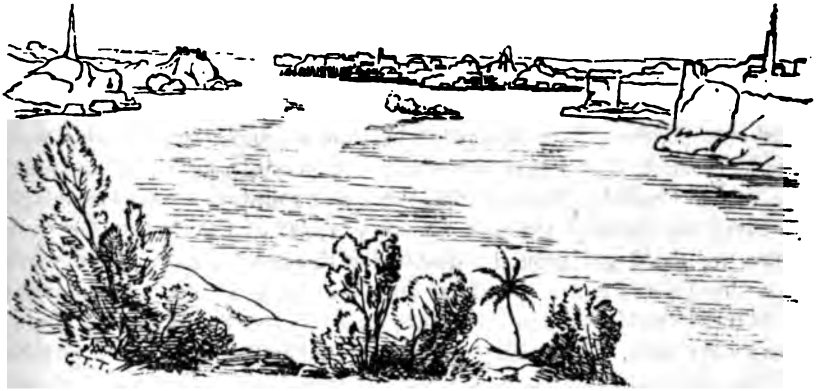


FIG. 1.—SUKKUR, ON THE INDUS.

Before going further, I shall advert to the first of the pictures high up on the screen, which affords a view of Sukkur from Rohri on the left bank of the Indus. Between Rohri and Sukkur, there is a rocky island on which a fortress was built by preceding dynasties, which is called the fortress of Bukkur. Our view is looking from Rohri towards Sukkur. In the background you will see the town of Sukkur, on the other side of the Indus, on low hills. Now, between my point of view and Sukkur there is to be carried the bridge of the Indus, by one mighty span from Rohri to Bukkur island, on the suspension principle. Between Bukkur and Sukkur there will be two or three spans. The difficulty is that between my point of view and Bukkur the river is so deep and so rapid that no pier could be constructed, and there is nothing for it but to cross this branch of the river with one span of 350 feet on the suspension principle. On the banks of the river at Sukkur you will see in the illustration a number of boats in the Indus. That will be considered the commercial basis of Candahar. It is also a military base. It was from there that General Stewart's forces, and all the materials of war and all those thousands of camels which you have heard of, were despatched. You will see also, on the river, steamers joining one bank with the other, until the bridge shall be built. You will see two sets of pillars. Those are the pillars of the electric telegraph, which is carried right across the Indus.

I thus convey you in imagination over the first 50 miles, across the green strip of country. It is entirely cultivated, or else covered with vegetation. After passing this green, you will bid farewell to vegetation for many a long mile.

I now enter upon the second division, namely, the country below the hills, and conduct you into the desert. The desert you will find coloured light brown in the map. You will perceive that on the left hand of the desert there are green strips which represent cultivation, which is carried on by irrigation by those streams which run from the hills. You will there remark a particular feature in those streams, that they have sources and courses but have no mouths, because as the irrigation goes on, they are merged in numerous streams and water-courses. And that is the remarkable feature of Central Asia: there are scores of rivers without mouths. Now the point is, that all these green strips were liable to such floods that we could not possibly carry a temporary railway to Candahar through these strips of country. We were obliged to carry the railway through the very midst of the desert, for there alone we could get ground suitable for the construction of the work. But this ground had a particular disadvantage in that it was waterless. It is light friable soil, the best galloping ground for horsemen that I have ever seen. You can imagine the difficulty we had in getting natives to face this desert. They declared they would die of thirst; but we sunk down tanks in the desert, and established a service of water trains by the railway as it progressed, in order to carry the water supply to the people at the works. The people numbered 3500, besides 1500 animals, and water had to be carried day after day, sometimes 50 or 60 miles, in order to supply this large number of mouths. Nevertheless the railway was carried on through this desert, at the average rate of two miles a day; sometimes we attained the rate of 2½ miles a day, and one day we got three miles. The construction consisted of two feet of earthway; besides that there was the laying down of the sleepers and the fastening down of the rails. These materials were gathered from great distances in all quarters of India, and I need not detain you on that topic. It has been considered the most rapid piece of work that has been done by any nation—at least out of America; but although I had the general supervision and direction of the works, I make no claim for credit personally. I would rather give the credit to Colonel Lindsay, the engineer-in-chief, and all the staff that worked under me. So I bring you through the desert approaching to Sibi.

I then ask your attention to the picture on the screen, illustrating the neighbourhood of Sibi. You will there see the low hills of Beluchistan beyond Sibi: you will see the hill of Kalipat in the extreme

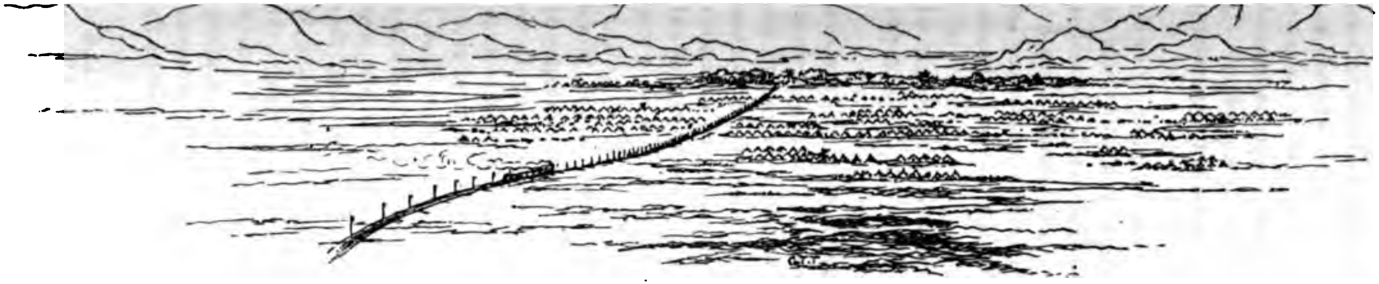


FIG. 2.—APPROACH TO SIBI: THE KACHI DESERT AND RAILWAY.

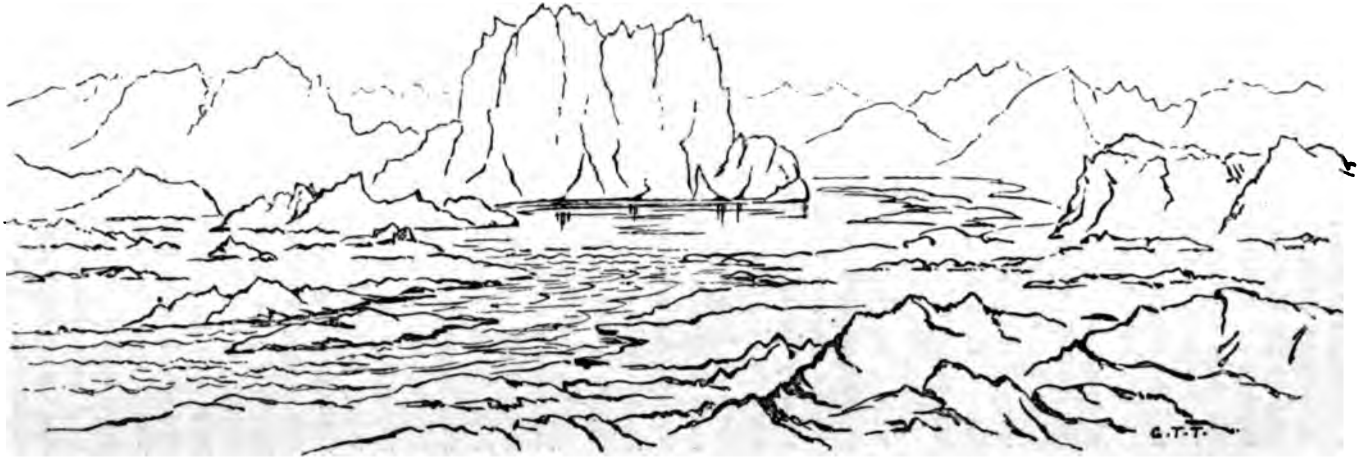


FIG. 3.—THE NARI GORGE.

distance; you will perceive, also, a long line of dark trees, the groves of Sibi, the only green trees to be found for many miles around, and on this side of the green trees you will see something that is meant to represent the encampment where the Bombay troops were encamped, which have since relieved General Stewart's forces in Candahar. In the foreground of the picture you will observe the line of the railway and the telegraph posts, and the immense expanse of desert.

We have now got through the desert 90 miles in addition to the 50 miles first mentioned, and thus I have brought you 140 miles on the journey which I am asking you to make with me to Candahar. Thus far, we have passed through regions that are familiarly known to many distinguished members of this Society—to such members as Sir Barrow Ellis and Sir William Merewether, who are no doubt present here this evening.

We have been, so far as the green part of the map is concerned, within the British territory: after that, we enter on the brown part of the map, and are then in the territory of Khelat.

We are now to enter upon part of the territory that was assigned to us by the recent treaty of Gundamuk—called the southern assigned districts of Afghanistan. We are also about to plunge straight into the hills, from which you will not escape for a good many miles to come, until I have to direct your attention to the great desert of South-western Afghanistan. So, now, you must make up your minds to quit the plains of India, and to be surrounded by hills for a considerable part of your journey.

As far as Sibi the railway line is marked continuously black, which indicates a complete and open rail—open at least, if not completed. After that you will find the railway line marked by a dotted line of black on the map, which indicates a railway that is under construction; and this railway, you will perceive, follows the line of the Nari river, which passes through a gorge called the Nari Gorge. After that it passes through one or two lines of low hills, and enters upon the Harnai valley at the foot of a mountain called Kalipat. After that it passes through a long cultivated valley until it crosses Chapar mountain; then the railway passes a rift or chasm in the great limestone geological formation. The railway makes use of the river to pass through this otherwise impassable limestone mountain. After that it enters on the upper valley, and so it gets to Gwâl, which lies upon the edge of the elevated plateau of Pishin and the flank of that range of mountains which separate Pishin from the lower mountains, and constitute the great natural defence of the plateau.

I have thus brought you for the moment as far as Gwâl and Pishin, and I must ask your attention to three pictorial illustrations of this part of the route. You will first note the picture of the Nari Gorge. You will see the low hills we have to pass in the middle distance, a light friable kind of rocks in all sorts of fantastic shapes, which are geologically insignificant as compared to the geological formations to which I shall presently call your attention. In the meantime you will understand that these lower hills can be easily blasted with dynamite. They were so being blasted some months ago, when I saw them, and thus the railway can be rapidly constructed.

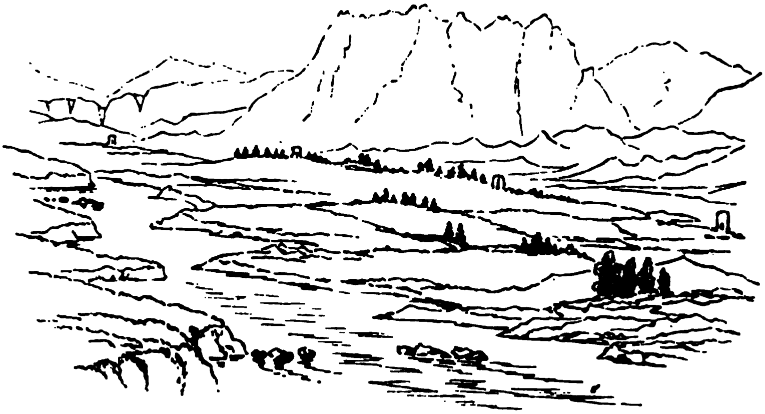


FIG. 4.—THE HARNAI VALLEY: KALIPAT MOUNTAIN IN THE DISTANCE.

The next view of the Harnai valley is of interest. In the background you have the mountain of Kalipat. Our railway has now attained the height of 3000 feet above the level of the sea, ascending gradually from Sibi which is reckoned at 700 feet. In the Harnai valley, then, we have attained the height of 3000 feet, and this Kalipat mountain is 11,000 or 12,000 feet. Thus our picture of Kalipat shows some 7000 or 8000 feet of sheer precipitous ascent overhanging this very valley. It is a magnificent limestone formation. Then in the middle distance you will observe a line of towers. They are the defences of the villagers in the valleys against the marauders of the tribes from the hills. These towers are refuges into which the wretched husbandman and his cattle may escape for the moment, while a storm of devastation and plunder sweeps over his fields. You will observe that the towers face the hills whence the marauders come, and behind the towers are the fertile fields. In the extreme left of the picture you will observe from the heights of Kalipat a slope of limestone formations, and in the left of the picture you will find rifts or chasms, and to these chasms I shall have immediately to conduct you.

For a better understanding of them, I must ask you to look at the next picture, which represents what we call the Chapar Rift. We take full advantage of that rift to pass the railway through it. There you see precipitous rocks overhanging the rushing stream, and on the left you will see ledges of rocks over which we shall conduct the railway.

We shall have to construct a viaduct with piers of 100 feet high, in order to approach those ledges. But this is not a difficult work; the foundations are excellent, and we hope to master the line of the railway within this rift or chasm. The point at which my view is taken is narrow like the neck of a bottle, but after that the railway gets into the valley opening like a bottle, and follows the course of the stream, and in that way we make use of the stream for the railway; and so, almost imperceptibly, we ascend up to Gwâl, which is 5500 feet above the sea (about 2000 feet higher than the Chapar Rift, which may be reckoned at 3500 feet). This incline, with the help of the river, will be effected

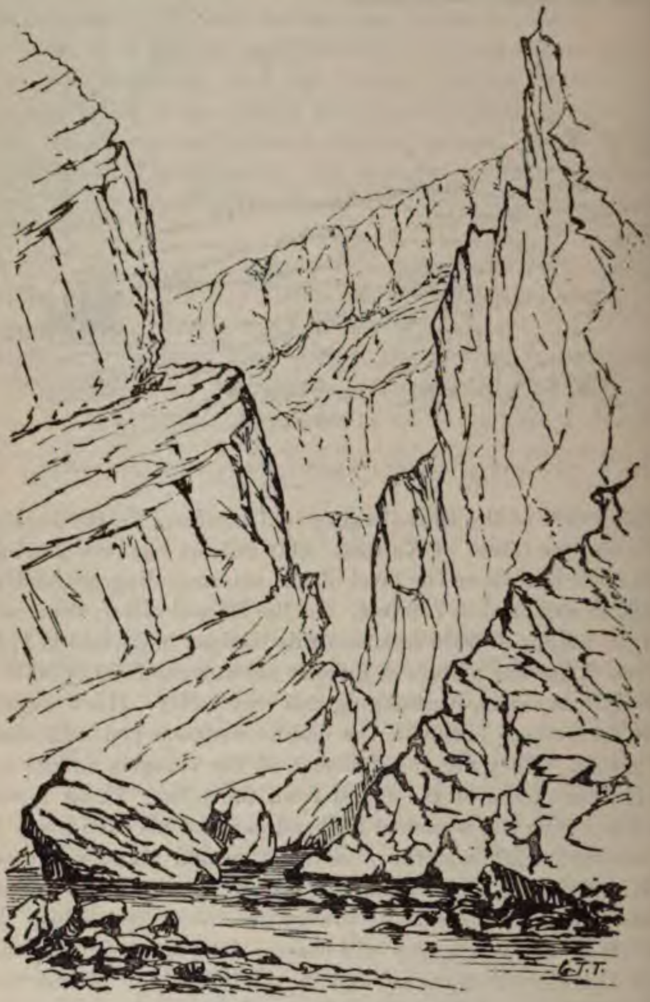
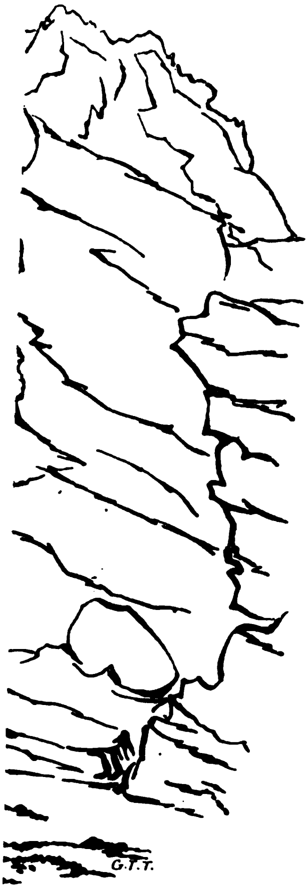
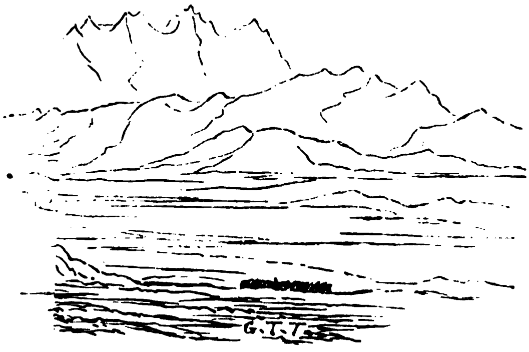


FIG. 5.—THE CHAPAR RIFT.





To face p. 537.

with comparative ease, considering the railway inclines in other parts of India or of the world.

I have thus advanced you another 100 miles of your journey towards Candahar, and I must now ask you to revert to Sibi. From Sibi you will see there runs on the map a direct line of military road to Dadar, and from there you enter upon the famous Bolan Pass—a pass by which the British invading armies have always passed from India to Afghanistan.

I will now ask you to follow me up the Bolan Pass to a place where you will see hills marked on the map somewhat darker than the rest.

Then you should look at the picture of this place. In the background you see the high mountains which flank the plateau of Quetta. In the centre you see the line through which the military and commercial traffic has to pass, and in the foreground you see the Bolan river running with branchlets and rivulets under the rocky formations. These rocky formations are geologically insignificant, but the colour of the water is admired by every educated person who sees it. It is the most beautiful mixture of azure and emerald. The stream goes careering over the shingle and sand, and that used to constitute one of the greatest difficulties of the pass. It was in the crossing and recrossing of this stream that everybody got so wet in the cold weather, and constant failure of health and strength was occasioned. Through the steadiness and industry of the Bombay troops under the direction of General Phayre, who is a brother of Sir Arthur Phayre, a distinguished member of this Society, we managed in a very short time to make a good military road, instead of the steep shingly inclines over which the guns and the military stores used to be laboriously dragged. The pass is now permeated by a road over which officers drive their dog-carts, and over which, when I left India, we were arranging to draw vehicles by horses at five miles an hour. In that way we get to the mountains which are exhibited on the background of the Bolan Pass, and so we reach the desolate plain of Beluchistan.

You will see this plain (called Dasht-i-Bedaulat or desolate plain) coloured light brown on the map. Now this is a plain of which travellers should beware during the winter season, for the most withering blasts sweep over it, sometimes in dust-storms, at other times in snow-storms, which chill people to death. I do not know that European lives have been sacrificed, but many natives have fatally succumbed to this benumbing, piercing wind. And so we get to the comparatively happy valley of Quetta.

Now the valley of Quetta lies in the bosom of grand mountains. These mountains are about 6000 feet above the altitude of Quetta, and Quetta itself is about 5500 feet. Dadar, at the bottom of the pass, is less than 1000 feet; but the plain I have just been describing to you is 6000 feet, so that the mountains near Quetta are from 11,000 to 12,000 feet in height. They are magnificent limestone formations.

Now this you will find illustrated on our screen by the panoramic view of Quetta. On the right hand of the picture you will see the mountain of Mûrdâr. The name signifies "the dead man's mountain," and the natives say that the reason why they call it so is because any man who tried to ascend it would be dead before he got to the top. In the distance to the right you will perceive the mountain of Zarghûn, which is remarkable for its forests of juniper, but in this clear atmosphere, in the evening light, so strong is the effulgence of the setting sun that the mountain looks at sunset like one mass of rose-colour. Then midway in the picture you see Takatu mountain, which separates the valley of Quetta from the valley of Pishin. The spurs of Takatu stretch to the left, and through a long gap in the Takatu spurs you see in the distance a line of blue-grey mountains, which form the Khoja Amran range, and between the spurs of Quetta and these blue mountains there lies the valley of Pishin. Further to the left you will see the mountain of Chiltan, or "forty persons," so called from a Mahommedan legend about forty saints, with which I need not detain you. In the middle distance you will see the town and mud fort of Quetta. In front of that you will see the houses and gardens that constitute the civil and military station of Quetta itself, built for the immediate accommodation of our troops; and further to the right you will observe the new British bazar or town. In the foreground you perceive the road leading from the Bolan Pass towards Quetta, and joining the road near Quetta you will see a road that comes from the Khelat country. I am sure that no view I could present, and no colours that I could depict, could give you any idea of the real splendour of this scene. These mountains, 12,000 feet high, with their magnificent rocks, at sunrise are lighted up with fire, and at sunset they blush with rose-coloured splendour. Down in the valleys, near the little groves, are now carried on British amusements. There are cricket-matches and lawn-tennis and Badminton, and other games, and on these scenes there look down the magnificent mountains. I suppose there are no more beautiful play-grounds in the world than those play-grounds of Quetta.

We have now got over another 120 miles of our journey, and I must ask you to look again at where I last conducted you on the map near Gwâl. We have now fairly entered the Pishin valley. From the town of Quetta there runs an indication of a military road, which road goes towards the well-known Gazaband Pass, where Generals Stewart and Biddulph passed with their troops towards Pishin. Now that the military road runs into the Pishin valley, and the railway line from Gwâl runs also into the Pishin valley, both the military road and the railway will cross the Lora river, which is indicated to you by the map as running through the valley of Pishin. Looking across the valley of Pishin, you see the Khoja Amran range, which is the real boundary of Afghanistan. This range takes its name from the tomb of a saint, Khoja Amran, whose tomb is at the top of the highest peak, but in reality this range is better known to Europeans from the two great military passes that exist within it: one the Khojak Pass and the other the Gwaja Pass, which latter, owing to the construction of the railway, is in the future more likely to become celebrated.

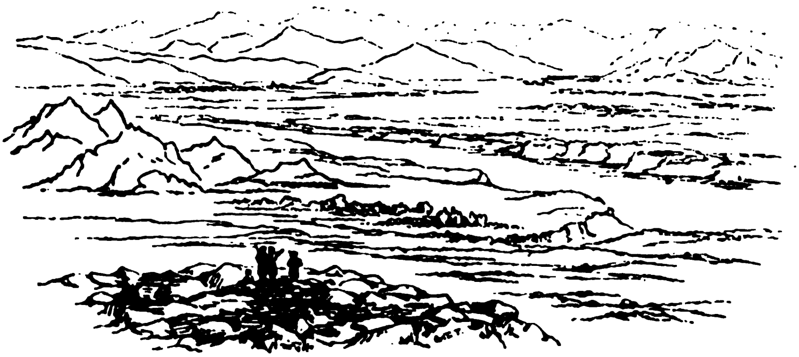


FIG. 8.—PISHIN VALLEY: KHOJA AMRAN RANGE IN THE DISTANCE.

I must ask you now to look at the next pictorial illustration on our screen. In the background you will see the Khoja Amran mountains, stretching like an old grey wall. At the foot of the hills you will see an indication of a well-known town, Kala Abdullah, and above there is the Khojak Pass. In the centre of the range you will see a peak which is called the Khwaja Amran Peak, and towards the left you will see the town of Gulistan Karez, which is a lovely place, with water-courses, canals, and fruit-gardens, and above that you will see where the Gwaja Pass is. In the middle distance you will see the partially cultivated plain of Pishin, and you will see the Lora river; and this view is taken from where the railway viaduct is to be constructed over the river.

Before I leave Pishin, I may detain you for one or two moments by explaining to you why we take the railway by the Nari river, instead of the old route of the Bolan Pass. Now, a railway by the Bolan route would have been vastly better than no railway at all, and would have been a great national advantage had there been no better route obtainable; but the Bolan route was open to certain objections, as there were very sharp curves, then stiff gradients, and then the great liability to floods during the storms of summer; then there was a foreign jurisdiction, that of the Khan of Khelat; but the main point was this, whatever might be the expenditure devoted to it, we could not make that railway safe at all seasons, and also there was a very rigorous climate in winter, as well as a great want of food supplies all along the line. On the other hand, by the route of the railway I have described to you, by the Nari river, we had much better curves and much easier gradients; we had complete freedom from the floods of summer—that is to say, we are able to take the railway beyond the reach of the floods; we had a much less rigorous climate in winter, and we had supplies along the line, and it will pass entirely through the assigned districts under British administration. Above all, we found by the help of the river a most excellent engineering line. The difficulty with lines of this kind is that you have to surmount the vast mountain wall which forms the flank of the elevated plateau of Beluchistan, and constitutes the boundary between Beluchistan and India. From some volcanic forces in geological periods, there have been great chasms and rents formed in this wall. Rivers rise in the plateau, which pass through these rents and chasms into the lower valleys. Our engineers took advantage of these rents and chasms, and of these ancient geological circumstances, and that is actually how we have obtained this line. From my personal knowledge of the line, I can assure you that you ascend minute by minute, and you are hardly conscious that you are ascending at all.

In confirmation of this fact I may mention that last November, I, in company with others, marched over a parallel route at a rate of 45 miles a day (or 90 miles in two days), and during that time we were scarcely conscious that we were ascending at all. Nevertheless on those two days we ascended 5000 feet.

Now, ladies and gentlemen, I have conducted you through the lower range of hills on to the valley of Pishin, and to the Khoja Amran range beyond. I have also asked you to remember that the railway is not, to ascend the Khoja Amran range by the Khojak Pass, which is the present military road, but is to ascend by the Gwaja Pass further south. I must, however, ask you to ascend with me the Khojak Pass, 8000 feet above sea-level, and that is the highest point to which I shall have to conduct you this evening. Having got in this way to the summit of the Khojak Pass, I will explain to you that the geological features of the range are comparatively insignificant, with the exception of the Gwaja Pass, where grand granite formations render the scenery very fine; in the Khojak Pass, where we now are, the scenery is poor.

I must now ask your notice to the picture on our screen which represents the view from the Khojak summit looking towards Southern Afghanistan. In the distance you will perceive the low hills of Candahar. In the extreme distance you will also see the hills of Northern or Upper Afghanistan. On the left in the distance you will perceive the desert of Southern Afghanistan, which desert, you will find, is marked with a large brown patch upon the map. In my pictorial illustration you will see it marked by a large dust-storm which is coming up in vast columns. I myself saw that dust-storm arise. It came from 60 miles off, and I saw it rush on with remarkable rapidity. We knew it was coming quick, so we tethered our horses under shelter in the lee of the summit, and we ourselves stood on the summit itself, in order to face the storm.

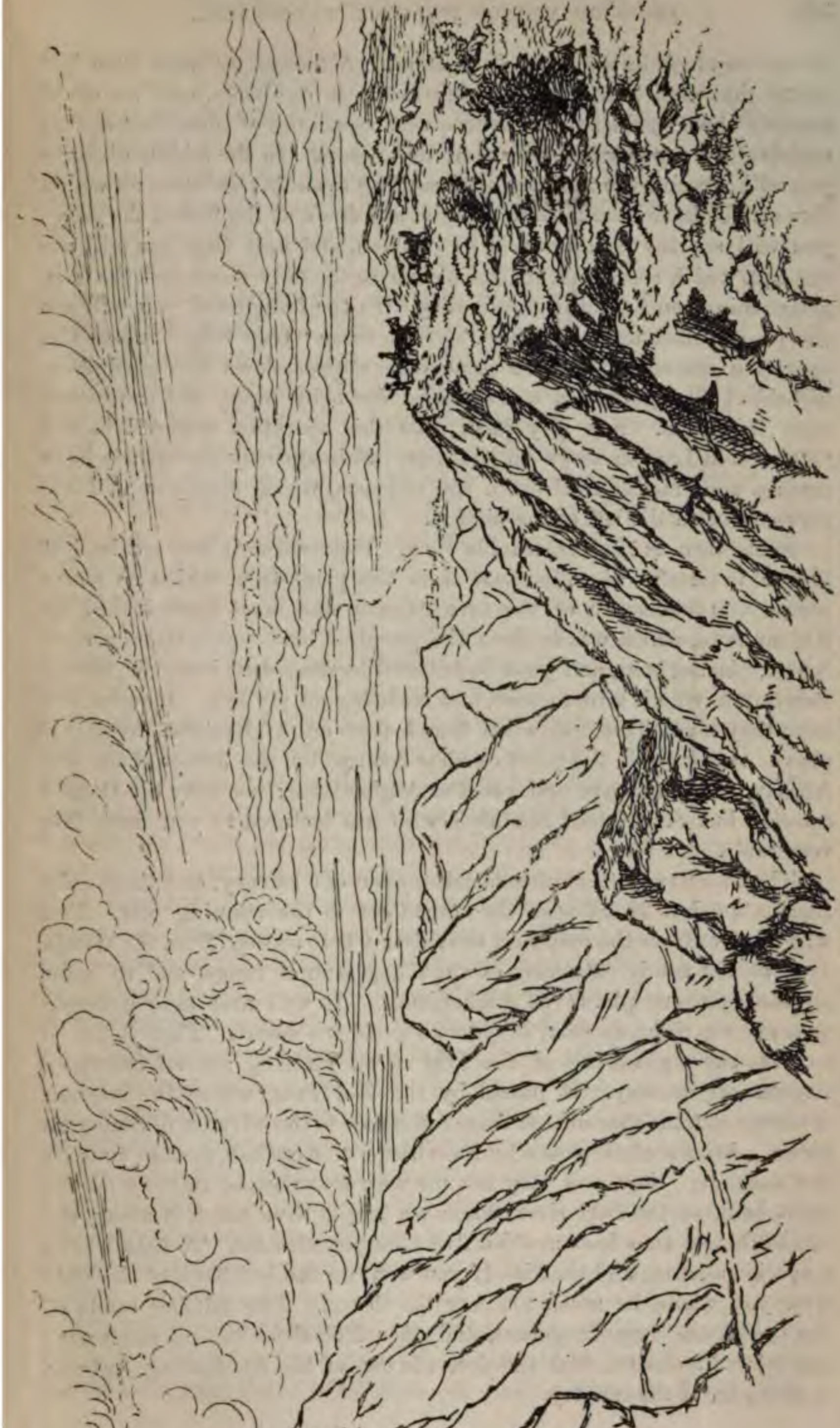


FIG. 9.—VIEW FROM THE SUMMIT OF THE KHOJAK PASS.

It was as much as we could do to stand. Although we were 3000 feet above that desert the dust blew furiously in our faces, and we could scarcely stand against it. The frequent occurrence of these dust-storms constitutes a noteworthy feature in that desert. In the middle distance you will perceive the military road running towards Candahar, on which line actions have been recently fought, and down at the foot of the range you will see the military post of Chaman, and near that you will see the spot which represents the spring where the only water and the only green thing can be got in the locality. In the foreground you will see the place called the "Gun Slip." This name "Gun Slip" means the operation whereby Stewart's guns were slipped down the precipitous hill-side. The guns had to be passed down by ropes, and the horses were led down. You may have seen this operation depicted in the 'Illustrated London News' of the time. Subsequently our officers have made a good zigzag road down the hill-side, which road you will see represented on the left of the picture.

Such, then, is this remarkable view. Picturesque it may not be, but it is a wonderful view, because it is the point from which so many heroes and statesmen of the first Afghan war must have looked on Afghanistan, which was to them the promised land—such statesmen as Keene, Macnaghten, and your excellent Vice-President here, Sir Henry Rawlinson, who is now present, and is sitting on my left. Imagine the hope they must have felt when they looked on Afghanistan from this place. And this is the point of view from which the heroes of the last Afghan war must have first gazed at Afghanistan; not only Sir Donald Stewart but Sir Michael Biddulph, who has lectured to you from this very table.

Thus we have got another 60 miles upon our journey, and there only remain the last 90 miles of the run to get to the winning post. You will observe from the map that the railway is to proceed from the Gwaja Pass at the south extremity of the Khoja Amran range, and to enter on the southern plains of Afghanistan. It will first take a sweep towards the right, or east, in order to avoid the desert. Then it has to run on the right bank of the Dori river, crossing several tributary streams on its way. It passes by the Mel Pass, where the Afghan Governor of Candahar offered some resistance to the advance of Stewart's forces. After that it passes by the village of Khushab, and so runs on to Candahar. Now, you may ask me why we take the railway on the right bank of the Dori river, when we might have taken it along the left bank, and thus have avoided five tributary streams. To that I have a specific answer, and that is—if you went on the left bank of the Dori river you would be much too near the desert. The drifting sands of the desert are very dangerous, and offer difficulties to the engineers; and you will observe that the desert is one of the dominating features in this part of the country.

It is this desert which mainly contributes to the political importance of the district of Candahar. Everybody who comes and goes either from India towards Central Asia, or from Central Asia towards India, must pass along the elbow of that desert, and rounding its corner must go by Candahar. That is one of the reasons why Candahar has always been deemed so important by all the great commanders and politicians in Asia, from the earliest ages to the present.

Now, then, I arrive at the last illustration of my pictorial series on our screen. This illustration shows the first view the traveller gets as he approaches Candahar. You will see in the extreme distance the hills on the other side of the Argandab river, which are spurs of the Siâh Kôh range. In the middle distance you will see a remarkable series of low hills rising a few hundred feet above the plain of Candahar, which is 3500 feet above the sea-level. Those hills are only a few hundred feet above the plain, but they constitute a very interesting series of trap formation. The low hills through which we have just passed near the Mel Pass are gneiss, while some of them are granitic. In front of the hills near Candahar you will see in the right of the picture the modern town of Candahar. To the left, again, you will see the ancient city and citadel and fortress of Candahar. They are wonderful ruins; they are not built of stone or brick, but of a hard and indurated earth peculiar to the immediate locality, and I have been told by officers of Artillery that they never saw bastions which would be more difficult to batter down. Immediately above this citadel, on the low range of hills, you will see in the distance some towers. In one of the many sieges to which this old city has been subjected (the new city is not above 150 years old), the enemy, by a striking military *coup*, got up to the hills during the night, took one of those towers by surprise, and so commanded the citadel and town, which had to surrender. In the midst of the modern city you will see the slightest indication of the tomb of Ahmed Shah, the founder of the Durani dynasty of Afghanistan, that dynasty which performed so important a part in the first Afghan war, and has been superseded by the Barakzai dynasty. In the immediate foreground there runs the military line to Candahar; but that is not the railway line, which will run somewhat towards the right. There is also some indication of the green plain of Candahar, excellently irrigated from running streams, skilfully cultivated, waving with harvests, and often yielding several crops within the year.

Perhaps this view is imperfectly represented; but it is one of the most interesting and beautiful views I ever saw in my life. It is that view from which people either take their first or their last look of Candahar, and it is a view that must have been looked upon with wonderment by many of the most distinguished, or of the most notorious characters in history—by Alexander the Great, by Tamerlane, by the Emperor Baber, by the Great Mogul, by Shah Abbas, by Nadir Shah,

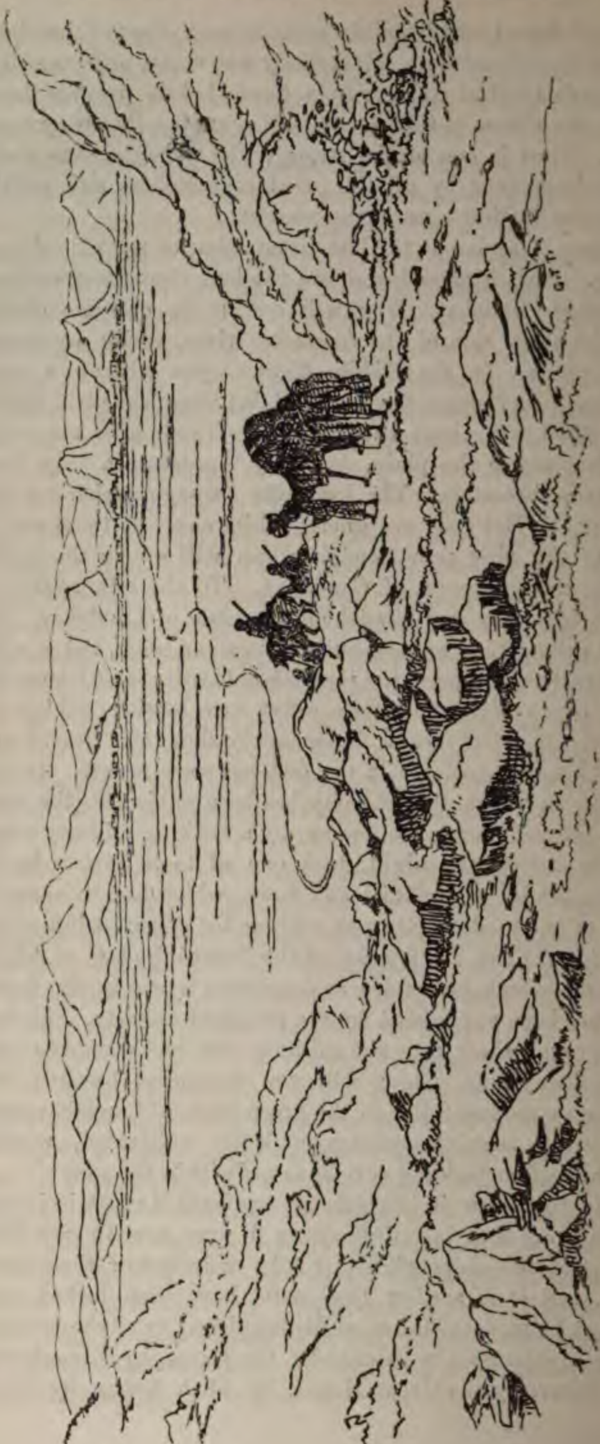


FIG. 10.—APPROACH TO CANDAHAR.

and others. All these extraordinary personages must have regarded the scene with as much wonderment as we do; for despite the revolutions of centuries this beautiful landscape remains the same.

Now, I have brought you to a distance of upwards of 400 miles from Sukkur, where I began my lecture, and I hope you have not found this journey exceedingly fatiguing or irksome.

I shall conclude by giving you a *résumé* of the distances you and I have, in imagination, travelled together. The country below the hills was 140 miles; the country within the hills was 120 miles; the country in the Pishin valley and the Khoja Amran range was 60 miles, and from the Khoja Amran range to Candahar 90 miles—altogether 410 miles. That may be called the military route; but the railway route which I have explained to you is somewhat longer. The railway route we take in this way: Indus to Sibi, 140 miles; Sibi to Gulistan Karez, 170 miles; Gulistan Karez to Gwaja—that is, the southern end of the Khoja Amran range—40 miles; from Khoja Amran range to Candahar 90 miles. The whole distance by railway line is 440 miles, say 450 miles with a slight margin for detours, and that represents the maximum journey which you have made with me to-night.

I may express the hope, before I sit down, that the statement I have offered is sufficiently scientific and geographical to satisfy the severe requirements of such a distinguished gentleman as Sir Henry Rawlinson, whose knowledge of these countries is unrivalled, vastly surpassing mine, although mine may be fresher, perhaps. I venture to anticipate that it may also satisfy the requirements of some of the Sind authorities present. I trust it has also been brief and graphic enough for the ladies and gentlemen who are members of the Geographical Society. I further believe that this oral statement, together with the pictorial illustrations, will have the advantage over a written paper, as it will enable you to carry away with you some pictures impressed upon the tablets of your brain and memory, better perhaps than any word-painting can pourtray. I hope that if you do carry away those pictures in your minds to-night, you will also think kindly and sympathetically of the men who have been engaged in these places—of the statesmen, politicians, and commanders who have formed so many great projects for the advancement of British interests in this quarter; of the British soldiers, your own white fellow-countrymen, your own flesh and blood, who have sustained your country's cause with a bravery which has never been surpassed, even in the annals of England; of the Native sepoys and soldiers, who have equalled in discipline and endurance their European brethren; of the Native Chiefs who have kept the road and protected our line of march, and who have also escorted many of us, and saved us from ambush and from overt attack, which otherwise would have proved fatal to us; of the men of science, civil and military, who have planned those important public works I have described to you to-night; and lastly of the patient, enduring, and industrious native camp followers, who had no particular reward to expect beyond their bare wage, who had no honours, no glory to anticipate, but nevertheless did their duty as men like the rest of us, and who have but too often left their bones to whiten in the localities that have been depicted to you to-night. Remember, ladies and gentlemen, that to whatever class or whatever profession these men belonged, whether the colour of their uniform was black, or red, or blue, whether they were white-skinned or dark-skinned, they were all one in their sentiment of loyalty to the British cause: they were comrades and brethren in arms, in policy, and in administration, for the promotion of those vast interests which are comprised in the British Empire in the East.

Before the commencement of the lecture the PRESIDENT (Lord Aberdare) said that he was glad that on this, the first occasion he had the honour to appear before a Meeting as President of the Society, he had to introduce a gentleman of the eminence of Sir Richard Temple. It was usual, he believed, on such occasions to say a few words introductory of the speaker. In the present case it seemed almost impertinent to do so, as so many important events in India had made the name of Sir Richard Temple almost a household word with us. It would suffice to say that he began his career in India in the school which has produced so many eminent administrators—that of the late Lord Lawrence. Raising himself through all the intermediate grades to the post of Lieutenant-Governor of Bengal, he had to struggle whilst holding that office against one of the greatest misfortunes which could overtake a country—famine; and he took such measures that he has the honest pride of saying that not one single life was avoidably lost during the time of that famine, a pride which might be shared by his (the President's) predecessor, whom he was proud to see before him—Lord Northbrook. Since that time, Sir Richard Temple fulfilled the highly important function of Governor of Bombay, and he then had to undertake the gigantic work of which he had now to give an account. These few words would suffice to introduce to the Meeting a gentleman whose career, after all, needed no commendation at his (the President's) hands.

After the lecture, the PRESIDENT said that, before calling upon any one present to take part in this discussion, he would venture to draw upon Sir Richard Temple's memory for a few prosaic facts. The first was the date at which this work was commenced, and the second, what gauge or gauges had been adopted in prosecuting this railway across the plain and through the mountain ranges?

Sir RICHARD TEMPLE said the Viceroy's telegram was received by him at Poonah on the 14th of September, and the work was commenced on the 1st of October. As to gauges: below the hills, the Indian broad gauge, which is 5 feet 4 inches, and inside the hills, from Sibi onwards, the narrow gauge, 3 feet 3 inches. But he explained that when the 3 feet 3 inch gauge is finished from Sibi onwards, the broad gauge from Sibi to Sukkur would probably be made narrow gauge, inasmuch as it was not deemed advisable to break the gauge at Sibi.

Sir RICHARD TEMPLE, also, in reply to a further question from the President as to the steepest gradients on the line, replied: One in forty.

The PRESIDENT said that, under ordinary circumstances, it would be his duty to call upon Sir Henry Rawlinson to address the Meeting, because no person present was more fully furnished with personal experience and study than he; but he was unfortunately suffering—he hoped temporarily—from an affliction of the throat which prevented him from addressing the Meeting. They had fortunately, however, present General Sir William Merewether, of Sind, the province which was originally occupied as a base of operation against Afghanistan, and he would therefore call upon him to speak on the subject of the railway.

General Sir W. MEREWETHER said he felt somewhat diffident in attempting to make any remarks, after the eloquent and most thorough manner in which Sir Richard Temple had described the scene of his labours and the work in which he had been engaged. He felt confident that there was nobody in that large and august assembly that had not been fully informed of and knew every inch of the ground from Sukkur to Candahar. Although, as he had mentioned on former occasions, he had spent a large portion of his life in Sind, he did not think he could add much to what Sir Richard Temple had said. He might, however, draw a contrast between the state of things described by Sir Richard Temple and what existed in former years, when our armies went into Afghanistan. Sir Richard had informed them that the telegram reached him on the 14th of September, and that on the 1st of October the railway was initiated. It would in time be carried on to Candahar. When completed, troops and goods would be able to travel from Sukkur towards Candahar at the rate of 16 miles an hour, under the most adverse circumstances. This would be a mere fraction of the time it took our troops to advance in 1839. From Sukkur to Sibi in former days was fourteen days' march. By the railway the distance could now be accomplished in twelve hours—not as many hours as it formerly took days. For the advantage thus gained, we were in great part indebted to the distinguished officer who had that night addressed the Society. Had it not been for his energy and the stimulus given to everybody, the railway might not have been completed now as far as Sibi; for after the month of April work was almost impossible, the heat being so great that all labour is obliged to be suspended. This rapidity of construction was, as he (Sir W. Merewether) had said on a former occasion, equal to anything that had been achieved elsewhere, not excepting America. There was one particular place on the map before them, to which he would beg to draw their attention, and in doing so pay a just tribute to one of the noblest Generals in the English army. It is Jacobabad, so called after his own name, General Jacob. He (Sir W. Merewether) had the honour of serving under that officer for many years, and from the knowledge he had of his personal character, he could say that there did not exist a more thorough English gentleman, a truer soldier, or more faithful servant of his country. Of his utter disinterestedness the Meeting could judge, from his deciding, in 1847, to make the place his home. He said (to use his own words), "The only way you can make the people of the country feel you are in earnest is to show them that you intend to live amongst them to work for their good." These are feelings which he (Sir W. Merewether) trusted would ever animate Indian statesmen, and lead statesmen and soldiers to carry forward the name of England in the country in which they were serving. The fears which were entertained regarding the dangers to which the railway was exposed from the Indus floods might, he thought, be safely set at rest. The embankment from Kusmore to Sukkur was made, he might say, under his supervision. The engineers were hampered at the commencement by deficiency of funds, but had instructions to make the best of it they could with the money at their disposal. At first breaches occurred, there being at that time in the Indus valley a cycle of years of inundations, which he hoped had now passed away. The superintending Engineer had staked his professional reputation that the embankment just mentioned would stand. The floods from Sibi and Dadar would be of little injury to the new railway, for, like similar places in America, the water could be allowed to pass over the railroad; it comes in the morning and passes away at night, and the injury is trifling. There is no danger, therefore, from hill floods by the Sukkur and

Sibi route. In conclusion, he said he felt he was only expressing the sense of the Meeting in saying that they were deeply indebted to Sir Richard Temple for the lucid and interesting account he had given of one of the most important works that has ever been undertaken in India.

General Sir Henry Thuillier expressed a hope that the labours of the engineers in surveying and mapping the country on either side of the line of the railway, might be brought into practical use for the rectification of the existing map. Both geographically and topographically, extensive materials had now been gleaned for the improvement and reconstruction of the map of Afghanistan.

The President, in his closing remarks, said that in listening to the description of the new railway, and of the difficulties of the old military roads which have passed for thousands of years through the Bolan Pass and over the Khoja Amran, he could not but think of the fearful sufferings and mortality of the animal transport in the last advance of the British troops. The loss of beasts of burden during the late war (he believed 25,000 camels had died) was such as to seriously interfere with the means of commercial transport. No person has ever had to contend with the difficulties and hardships of travel in this mountainous region without retaining a vivid recollection of the sufferings he had endured. The utilisation of the fertile tracts of the interior, which have never been turned to profit, would justify the railway from a commercial point of view. As to its military importance, that was a question which would afterwards have to be decided. He could not sit down without referring to the historical interest which this portion of Afghanistan possesses. When the advance of the British troops was made into this country, many must have been led to refresh their memories by turning to the history of Alexander the Great, who entered India by the Khaibar Pass and the northern route, and on his return to Persia, dividing his army into two parts, he led one division himself through Beluchistan, the other marching through the Bolan Pass and over the Khoja Amran, operations which resulted in the loss of three-fourths of those two armies. In conclusion, he would invite the Meeting to join in expressing their thanks to Sir Richard Temple for his instructive lecture.

Notes on the Country between Candahar and Girishk.

By Captain R. Beavan, F.R.G.S. and C.M.Z.S., Bengal Staff Corps, Assistant-Superintendent, Survey of India.

There is not much interest, in a purely geographical point of view, in the route between Candahar and the fort of Girishk on the right bank of the River Helmund. But it is of great importance as a military position, lying as it does at the extremity of the vast mountain masses that break up the whole of the country between the rivers Helmund and the Arghesan into a troubled sea of rock, hardly practicable even for pedestrians, and forming a complete obstacle to the movement of large bodies of men with military impedimenta.

Skirting the route, to the south, lies the great sandy desert, equally impassable to troops, and thus the tract I now describe forms practically the sole military passage between the east and the west, between India on the one hand and Persia and Turkistan on the other. It is, in fact, for armies what the Suez Canal is for ships. Certainly there are other entrances to India, such as the routes viâ Chitral and viâ Bamian, but these are, so to speak, back entrances, and involve crossing mountain passes of 12,000 feet and upwards. A formidable army of invasion would necessarily have to traverse the road from Girishk to Candahar. The simple fact that natives of the country travelling from Kabul to Herat or *vice versâ* will go by preference round by Candahar, and that this, though apparently circuitous, is considered the regular route, proves that the other routes are difficult and uncertain.

The narrow strip of plain which this route traverses forms then the interval between the desert, on the one hand, and the hilly country on the other. The desert rolls up in undulating sandhills from the far south. It is traversed and inhabited by nomadic tribes, who graze their camels and flocks on the scanty herbage, and who live in tabernacles of black blanketing, and relieve the dull monotony of such an existence by raids and fights with each other, and with their neighbours. Water is to be found, they say, throughout the desert in certain places, but it would be risky for any one who had not been born and bred there to attempt to travel through it.

The sand is bounded by the rivers Argandab and Dori, the thin line of running water seeming as if it had some magic influence in restraining the overflow of the sand. It is just the reverse of the phenomena of the sea-shore. There the narrow belt of sand appears to impose a limit to the inroads of the waves. Here a thread of running water seems to say "thus far" to the encroaching sand dunes. To the north are the mountains, bare and rugged, not a sign of verdure anywhere about them, not an indication of moisture. The ridges run nearly parallel to each other, with a general direction from north-east to south-west.

The great peculiarity of this country is that only the upper portions of the hills are exposed above ground. The whole country, including the lateral valleys, appears to have been filled up, at a date subsequent to the elevation of the hills, with a deposit of rubble, waterworn boulders, and pebbles, with hardly sufficient soil to hold them together. The elevation at this part of the country is over 3000 feet, but the same peculiarity is observable throughout Beluchistan down to the bottom of the Bolan Pass, at an elevation of some 600 feet only. Everywhere we find parallel ranges of rock, with flat open valleys between formed entirely of boulders and shingle, barren in appearance and exasperating in effect.

This deposit, though apparently level, in reality slopes considerably upwards from the rivers to the base of the hills, and in the valleys it has also a good slope in the direction of their length. Attention to this fact will enable us to understand better the peculiar system of irrigation, by means of the "karez," or underground aqueduct, which is so constantly made use of in this country.

The soil being naturally open and porous, composed as I before noted, of waterworn stones imbedded in a sandy soil, which, however, having a large admixture of lime, hardens at a short distance below the surface into an impermeable conglomerate, it is easy to understand how flowing water may in many places be found 20 or 30 feet from the surface, while on the surface itself for miles round there is nothing but an arid plain. The water thus found is led gradually towards the surface through the karez. A series of wells are dug at intervals of 15 to 25 yards, and connected below by an underground passage, through which the water runs till at last it reaches the surface and is utilised for irrigating the fields. In this manner the low-lying parts of the valleys are cultivated, partly by karez water and partly by irrigation canals taken from the rivers. The two rivers of this district are the Helmund and the Argandab. The latter receives the Dori, Tarnak, and Arghesan, but neither of these contribute a large supply of water.

The minor affluents of these rivers, as shown on the maps, are deceptive. The largest for instance, of these, taking the drainage of the Khakrez Valley, and emerging from among the hills at Khushk-i-Nakhud, contains only a little water in some parts of its course. The others are merely surface-drainage courses, extending a short distance from the hills and then lost altogether, and only carrying a little water after heavy rain. At the junction of the two rivers is the fort of Kala Bist, and from this point along the banks of the Helmund to a considerable distance above Girishk, are scattered the remains of numerous forts and entrenchments, showing the importance that has always attached to the defence of this part of the Helmund River. This district presents a rich and almost unexplored field for archæological research, and will doubtless some day well repay a careful exploration, whenever the state of the country will permit of its being traversed by unofficial explorers. Girishk itself is simply a fort, commanding the Herat road; there is no town near it, but the whole of the Helmund Valley is full of small scattered villages and hamlets, with gardens, trees, and fields. Under a settled government a great deal might be made of this fertile strip of land along the rivers, as also of that along the Argandab; at present they are liable to be pillaged by every body of troops that may chance to traverse the land. For example, just before our arrival, they had been visited by Mir Afzul Khan, the ex-governor of Candahar, who retired with a mob of cavalry towards Herat as soon as our troops made their appearance. The inhabitants, therefore, are well used to being raided upon, and in consequence they only grow sufficient for their own requirements from one harvest to another. They did not understand at first our plan of paying for what we required; but even when they saw we meant it, they could not supply us very liberally, as they had simply nothing to give us but what was put by as food for themselves and their families for the next five or six months till harvest time.

The position of Girishk on the old maps is very fairly accurate. I make the latitude of the fort 31° 47′ 24″, and the height 3050 feet above sea-level. I was not able to visit any of the hill-tops in the neighbourhood, but I fixed the position of a number of distant peaks with reference to Girishk. Beyond the river, the ground rises gradually. To the north-west, by the Herat road, the country is mountainous, and again towards the north-east by the Upper Helmund; but in a northerly direction it appears quite open and level as far as the eye can see, the only exception being that on very clear mornings after rain a few snowy peaks can be seen, just showing their tops above the horizon. I have secured bearings to some of these, but failed in recognising them from more than one point, and can consequently form no idea of their actual distance.

The subject of barometrical heights will I think repay a careful reconsideration. The formula usually recommended for travellers is based upon barometric differences between two stations, the height of one being known, and the observations being made simultaneously or nearly so. The result, however, is affected considerably by the temperature of what is called the "intervening stratum of air." Now, in the elevated plateaus of Central Asia it is difficult to assign even an approximate value to this element. It cannot be represented by the mean of the observed surface temperatures, for the reason that this latter has often an excessive daily range, on account of the great heat of the sun's rays in the daytime, and the excessive radiation at night. For example, near Quetta in the winter the thermometer may read 15° in the early morning, and 55° a few hours later. It would be, I think, very useful if tables could be compiled in a convenient form by which absolute heights could be deduced for the use of travellers in Central Asia. Such tables would of course involve a large amount of work, and could only be compiled from actual records extending over a long period, and embracing such latitudes as would be required in practice. I therefore take the present opportunity of suggesting the subject in the hope that some one among the members of the British Association, who may have the time and the means at his disposal, may be induced to take the matter in hand, and thereby earn the thanks of future explorers. I append a memorandum* showing what tables would, I think, be found

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* Table I.—Giving B = the normal barometric reading at sea-level, corresponding to different latitudes on different dates, taken for a given time of day (say 10 A.M.).

T, the normal mean temperature, for the same date.

Table II.—Correction for hourly variations to reduce the readings of aneroid on certain dates to the given hour (say 10 A.M.).

Table III.—Approximate heights above sea-level, corresponding to barometric readings, referred to different values of B, Table I.

Table IV.—Normal temperature from Table I. corrected for approximate height above sea-level.

Table V.—Correction to approximate height on account of difference between

desirable. I may mention here that the aneroid barometers by Messrs. Troughton and Simms, as used in the survey of India, have proved very reliable, and not liable to sudden changes of index error under very severe changes of altitude. It is of course necessary to test them occasionally by boiling-point observations.

Visit to Skyring Water, Straits of Magellan.

By R. W. Coppinger, H.M.S. *Alert.*

Since the original exploration of Otway and Skyring Waters made by Fitzroy in the year 1829, no reliable information, that I am aware of, was obtained regarding these interior waters until November 1877, when the Chilian gunboat *Magellanes* visited them, and made a stay of three weeks in Skyring Water, during which time her boats were employed in effecting a partial survey of its shores. One result of her survey was to show that Skyring Water greatly exceeds the dimensions assigned to it in our latest Admiralty chart (No. 554), and that its western extremity—as laid down from an eye-sketch—is in about 73° 20′ W. long., which gives to Skyring Water a length from east to west of 64 miles, i. e. pushing its western limit 32 miles further to the westward than our Admiralty chart would indicate. Strangely enough, Fitzroy's old chart coincides very fairly with that of the more detailed survey since made by the

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the actual temperature at place of observation and normal temperature from Table IV.

The method of computation with the aid of these tables would be as follows:—

Let aneroid reading = b,

Correction for index error of aneroid = c,

Correction for time of observation from Table II. = d;

Then true barometer height for the standard time on the day of observation = $b + c + d = B'$.

Normal barometric height at sea-level for the same day and the same hour = B.

Then with B and B′ find from Table III. approximate height of place of observation = H.

From Table I. take normal mean temperature at sea-level for day of observation T.

By Table IV. reduce this to normal temperature at place of observation T′.

Mean temperature for the day at place of observation t.

Then with the difference of T and t enter Table V. for a correction to be applied to H to give absolute height above sea-level, affected only by temporary or abnormal variations of pressure. These variations are not large in amount, nor frequent, in the interior of the continent, and a series of observations would give a good mean value, while if comparison could afterwards be made with readings at some point the height of which was known, and which was not too far distant, the error due to this cause might be eliminated. It is not always possible for a traveller to read his aneroid at a particular hour of the day or night, hence it is necessary to have the means of reducing his readings to one standard time. The observer can find his mean temperature (t) of the day for himself, either by keeping a record of maximum and minimum daily temperatures, or by accepting the temperature at a certain hour as the mean. This hour will, of course, vary with the seasons, but is easily determinable by experiment.

Chilians, and we are at a loss to understand why the Admiralty should have expunged the western half of Skyring Water as delineated by Fitzroy, and have placed land in its stead. An account of the Chilian survey, with charts, is given in the 'Anuario Hidrografico' for 1879.

The direct object of the recent visit of the *Alert* was to ascertain the value of a coal-mine which had been recently started on the north-east shore of Skyring Water, and to ascertain if it could be made available for steamships passing through the Straits of Magellan.

On the 5th March, about 5 A.M., the *Alert* started from her anchorage at Tilly Bay, on the southern shore of Magellan's Strait, and steaming northwards across the strait, entered the Jerome Channel. Here we experienced a strong current from the south, which was attributed by Mr. Petley, our navigating officer, to the flood-tide making into Otway Water. This channel is 20 miles in length from its southern end, opposite Tilly Bay, to its northern extremity abreast of Corona Island, where it begins to dilate into the wide expanse of Otway Water. Its shores are lined by precipitous mountains, of an average height of about 1000 feet, clothed to their summits with a dense forest, so that the scenery, so far, is similar to that of the western parts of Magellan's Strait. Behind, and towering above this coast range, are hills of a greater altitude, whose summits are clothed with a glistening mantle of snow and ice, the source of the glaciers flowing southwards into the main straits. As we entered Otway Water, we saw on our starboard hand a broad expanse of water, limited in the distance by a coast-line of comparatively low land, while on our port side there was a marked transition from the lofty hills of the Cordillera to an upland plain of undulating hills covered with forest, and sloping gradually downwards to a low plain as it extended to the eastward. In fact, we had passed through the backbone of the Cordillera, and were now approaching the alluvial plains of Patagonia; and to confirm this impression, we found that we were now gradually exchanging the cloudy sky of Magellan for a brilliant sunshine and a clear blue sky—a change only to be fully appreciated by those who have spent many months in the damp, cloud-collecting region of the western straits.

The north shore of Otway Water is low and shelving, presenting a glistening margin of sandy beach, and fringed by a broad zone of shallow water. In the afternoon we entered the Canal of Fitzroy, where we encountered a strong current from the north (i. e. from Skyring Water), which considerably impeded our progress. At 4 P.M. we grounded on a sandbank, getting off, however, without much difficulty; and soon afterwards we dropped anchor in a bight, where a sharp curve in the canal afforded us shelter from the current.

Both shores of the canal are low, and formed of alluvial matter, of which the banks in places afforded us good sections; and well-marked terraces testify to the upraising of the land. On the western side the land is covered with bush, but the eastern side presented the appearance of Patagonian pampas land, as it is seen to the eastward of Sandy Point. A party of us landed here, and spent a few hours in exploring the country. The soil was a dark loam, bearing a rich crop of grasses of various species, and studded here and there with clumps of trees and bushes, among which we noticed the Antarctic beech, the *Embothrium*, a berberry, and a *Chilobothrium*. Herbaceous composite plants grew in great profusion, and many specimens of a Lychnis were seen, but unfortunately the season was too far advanced for collecting useful specimens of flowering plants. We saw numerous tracks of wild cattle and horses, and a few deer tracks, but in the course of our ramble failed to meet with any of these quadrupeds. The skull of a puma was picked up, but no recent signs of that animal were observed. The ground was everywhere riddled with the burrows of the "tucutuco," that pest of horsemen. The birds seen were similar to those of the Magellan region. In the immediate vicinity of the ship great numbers of black-necked swans and crested ducks were seen during our absence.

On the following morning we were under way at five o'clock, and continued on our course. As we emerged from the northern extremity of the Canal of Fitzroy, we met with hundreds of swans, swimming in flocks upon the smooth surface of the water, and little heeding us as we steamed through their midst. As we now skirted the east shore of Skyring Water, we saw two men walking along the beach with bundles on their backs, and apparently engaged in shooting swans. We afterwards learned that these men were deserters from the coal-mines, who were making their way on foot to Sandy Point, a distance of nearly 100 miles.

At 10·30 A.M. we reached the Bay of the Mines, and anchored about half-a-mile from the shore. The settlement was larger than we expected, and exhibited fair signs of activity; several shingle-built houses, large store-sheds, and a steam saw-mill showing out conspicuously against the dark background of forest which spreads for a few miles to either side of the settlement, and inland to near the summit of Mount Rogers, a hill to the northward which reaches an elevation of about 1000 feet.

The Skyring coal-mines were originally started about three years ago by an enterprising German named Haase, who opened the seam, extracted some coal, erected sheds, but soon afterwards (I understand through want of funds) abandoned the undertaking; so that when the Chilian gunboat *Magellanes* arrived here in October 1877, the settlement was found to be deserted. Captain Latorre then made a trial of some coal which he found lying in a heap near the pit's mouth, and after executing a partial survey of Skyring Water, was recalled to Sandy Point, on receiving news of a disastrous mutiny in that colony.

The settlement remained uninhabited from the time of the *Magellanes'* visit until the 15th November, 1879, when the mines were reopened by

Mr. Haase, furnished with funds provided by a company which had been formed at Buenos Ayres. Since that time the work has progressed steadily, so that the material of the mines is now in a tolerably efficient state. The population numbers about 20, but during our stay some of the workmen left for Sandy Point, disgusted (it is said) at non-payment of wages, so that evidently Mr. Haase has difficulties to contend with.

Part of the coal-seam which is now being worked is visible in the face of a low cliff on the north-west point of the Bay of the Mines. The outcrop of the seam is in a north and south direction, and it dips to the eastward at an angle of about 45°. From a cursory examination which I made of the section afforded by the adjoining cliffs, I ascertained that the coal was overlain by a bed of clayey sandstone, above which was a stratum of limestone containing fossil shells, among which large *Ostrææ* were the most conspicuous. Above this and also lying conformably to it, was a layer of soft sandstone almost devoid of fossils, and above this again was a bed of soft sandstone containing numerous comminuted fragments of shells in a subfossil state. The coal-seam was about 12 feet thick.

A sample was taken on board and submitted to various practical tests by the engineers of the ship. It is of a jet-black colour and of glistening appearance; leaves a faint black mark on rubbing; contains sulphur and iron; burns with very little smoke, and leaves a rust-coloured ash, which forms a proportion of about 18 per cent. The specific gravity is 1·3. When used in the furnaces it forms large cakey masses of clinker, which adhere to the bars, and clog the fires so much that it is found impossible to raise steam to more than 30 lbs. pressure. In an open grate it burns freely enough, but without giving much heat. It is, therefore, unsuited for compound engines such as ours, which require high pressure steam.

Game is now scarce in the immediate vicinity of the coal-mines, and we were surprised to find that the workmen were subsisting on salted and tinned provisions. Beyond a radius of five miles, deer, guanacos, ostriches, and wild cattle are to be had, but cannot be taken without the aid of horses; with which useful animals the settlers are at present (apparently through pecuniary embarrassments) unprovided.

We visited a bay seven miles to the westward of the settlement, and in the course of a few hours' walk over the pampas, found abundant tracks of wild cattle. On the western shore of this bay there are two remarkable terraces or elevations, which are so perfect as to present an almost artificial appearance. Here the formation is a hard unfossiliferous sandstone, bedded horizontally. Erratic boulders of gneiss and syenite were scattered along the beach and in the shallow water.

The mining engineer (M. Arnot) was of opinion that on piercing deeper into the coal-seam, a better quality of coal would be met with.

The present workings are at a depth of only 36 feet from the surface, and as the angle of dip is about 45°, it is not improbable that on sinking a deeper shaft his expectations may be realised. Should this be the case the long cherished scheme of establishing tug steamers in the Straits of Magellan to tow sailing ships from ocean to ocean, will probably be revived, and a wider scope will then be given to the utility of the Straits as an avenue for commerce. Moreover, should a permanent settlement be established at the Skyring coal-mines, colonists will be attracted to this part of West Patagonia. The soil of the surrounding pampas is of excellent quality, for, from its proximity to the Cordillera, where the easterly drifting Pacific clouds deposit most of their watery contents, it receives enough moisture to remove from it that arid dryness which has rendered the eastern part of Patagonia unsuited for the agriculturist. There is at present good pasturage for cattle, and from all we know of the climate, I see no reason why cereal crops should not flourish.

The interesting question as to whether there exists a channel connecting Skyring Water with Smyth's Channel has not yet been settled. Mr. Petley (our senior surveyor) tells me that both on our outward and return voyage, he observed that the flood tide in the Canal of Fitzroy made from the northward, a circumstance also noticed by Captain Latorre of the *Magellanes*, in 1877, who, from this and other circumstances, was inclined to believe in the existence of a western entrance to Skyring Water. On the other hand, the rise and fall of the tide at the Bay of the Mines was hardly perceptible.

Our return journey to Tilly Bay, where we anchored on the evening of the 9th, was accomplished without any occurrence worthy of note.

GEOGRAPHICAL NOTES.

Return of the Society's East African Expedition.—Mr. Thomson left Zanzibar for England by the mail steamer of the 28th of July, and is expected to arrive in London before the issue of the present number of the 'Proceedings.' Pending the full report which he will, in due course, submit to the Society, the Fellows and subscribers to the African Exploration Fund will be interested in the following letters, containing an account of the latter part of his very successful journey:—

KAREMA OR MUSAMWIRA, LAKE TANGANYIKA,
27th March, 1880.

MY DEAR DR. KIRK,—You will by this time have learned that I have failed in my attempt to reach Iendwe by way of the Lukuga and Kabuire. I left Kasenga (or Mtowa) on the 19th of January with all the confidence of a young lion which had not yet known a reverse, and six weeks after I returned to the same place as meek as a lamb.

From the very first day I had great difficulties with my men, as they believed I was taking them to Manyuema, where they would all be eaten up. They tried every means in their power to throw obstacles in my way and retard my movements, two of them deserting near Meketo, and the others threatening to do the same. For six days I continued my course along the Lukuga, in spite of their opposition; but I was then obliged to give in, at a large Uguha village, called Makalumbi, in about E. long. 29° 27′ and S. lat. 5° 41′. It (the Lukuga) flows in a general W.N.W. direction to that place, and then about west into the great westerly bend of the Congo, all the way through a most charming valley, with hills rising from 600 to 2000 feet in height above the lake. The current is extremely rapid, and quite unnavigable for boats or canoes of any description, owing to the rapids and rocks.* From Makalumbi I crossed the Lukuga into Urua, and struck south-west for the town of Kiyombo, who is the chief of all the Warua on the eastern side of the Congo.

I found, however, I had only escaped from difficulties with my men to fall into ten times worse ones with the Warua. They turned out to be the most outrageous scoundrels and thieves I had yet met. It is utterly impossible to convey to you the miserable life we led during the five weeks we were in their country. They had not the slightest acquaintance with traders, and they had no respect for the white man. The chiefs demanded exorbitant mhongo, and made us stop wherever they took the fancy; the people were by no means loth to help themselves by tearing the clothes off the backs of the men even in crowds. Several times they turned out to fight us. Arrows and spears have been aimed at me within a few feet. For rudeness and insolence they are unparalleled. They would come and tear open my tent door to look at me, until I had to give it up altogether. They generally became worst at night, besieging us in our huts; and several times we had to sit up all night, with howling hundreds around us, ready to fight or fly. At one village a crowd had got hold of one of my men, and I only forced my way in just in time to deflect a descending axe, which would have ended his days. And yet we had to show ourselves firm as well as pacific. The slightest accident or blood drawn, and not a soul of us would have escaped. They seemed just to thirst for our blood, but still they were afraid to attack us in case Kiyombo might be displeased.

At last we reached the big chief's, and within about ten days of Iendwe, and there, after being kept a week, we were informed, to our immense disappointment, that we could not be allowed to pass, as they were at war with the country in front; and to make matters worse, we were further directed to return exactly the same way we came. And back we had to go; and what a time we had of it! How we ever escaped with our lives I cannot comprehend. Imagine being awakened in the dead of night in your tent by your blanket being torn from under you, just in time to catch hold of your azimuth compass, and to find your watch gone. Such was one of my night's adventures. Fortunately they got frightened at the watch, and the chief brought it back next day.

The chief took an immense fancy for all my personal articles—clothes, cups, blankets, &c., and would have left me with only what I had on my back, if I had not had a few things hidden away. To have seen me in camp you would have thought I had not an article but a bare tent and a blanketless camp-bedstead.

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* Dr. Kirk remarks as follows, with reference to this important observation of Mr. Thomson:—"The great difference of level thus indicated would suggest that the partial barrier which existed at the time Lieutenant Cameron first discovered the outlet of the lake, was caused by the temporary closing of the stream, through a mass of floating vegetation becoming entangled at a time when the current was not sufficient to sweep it away. Once rooted, an obstacle of this sort is known to have caused great changes in other African rivers, and would account for the recent rise of the general level of the lake which travellers have made mention of, and which there is reason to believe has been taking place until a recent period."

My food I had to take without cups, or other civilised arrangement, as they were instantly demanded when seen. These facts will give you some faint notion of our troubles, and of the delight we felt on once more crossing the Lukuga. We reached Mtowa on March 10th, destitute of almost everything. To my delight, however, I heard that Mr. Hore was expected every day on his way by canoe to the south end of the lake, and that he might be able to take me, though not all my men.

I had just sufficient cloth left to give two doti to each of my men, and pay for a canoe to take them across to Ujiji; so on the following morning I shipped off twenty-eight men, keeping ten men with me, trusting to my chance of getting down with Mr. Hore. Nor was I disappointed, for on his arrival on the 18th of March, he at great personal sacrifice made room for me and my men, and thus a second time proved to be of great service to me.

On the 23rd we started, crossed the lake to Kungwe, and reached Karema on the night of the 26th. As we neared the shore we were hailed by the jolly voice of Captain Carter,* whom we found gun in hand, and bursting with stories of his wonderful adventures in sport and war, keeping us fixed in our seats all night in his tent as he launched them forth.

We went over to visit the Belgian international party at their temporary quarters to-day. Captain Carter had his elephant ready to take us across the marsh. Karema is one of the most extraordinary places for a station that could be found on the lake;—a wide expanse of marsh, a small village, no shelter for boats, only shallow water dotted with stumps of trees, no food to be got and natives hostile, far from any line of trade. The party have commenced building forts and walls, digging ditches in regular military fashion. At table there sat down an Englishman, an Irishman, a Scotchman, a Frenchman, a Belgian, and a German, representing five expeditions; and you will doubtless be pleased to learn that of all these (thanks to yourself), the Scotchman, though the smallest, and having to travel through entirely new country, has been the most successful of all.

During the meal we were transported back to the streets of London on being favoured with a few operatic selections by Debaize's 1200-franc hurdy-gurdy. Thereafter each one ransacked his memory and imagination—especially the latter—in producing the most wonderful adventures with the wild animal or the savage native. As evening approached, the elephant once more made her salaams to us, and mounting her back we bade adieu to the Belgians, and returned greatly impressed with such a curious meeting in such an out-of-the-way place.

I hope to reach Kilwa about the time this letter reaches Zanzibar, if no other unlooked-for event stops my progress. JOSEPH THOMSON.

KWIHALAH, UNYANYEMBE, *May* 26th.

MY DEAR DR. KIRK,—Here I am back on the old road, in spite of all my efforts to keep off it.

After leaving Karema we had a moderately good voyage across the lake to Iendwe, at which we arrived on the 7th of April. I was much pleased to find everything in good order, and the men all in pretty good health. Chumah had kept them all up to the mark, and had been but moderately extravagant; the only matter over which I had to groan was the sight of nearly all my good cloths flaunting on the backs of greasy natives and Arab women, Chumah having carefully selected for use only such bales as had good cloths, leaving me with hardly anything but merikani. What annoyed me more was the news that my projected route to Kilwa was quite impassable. Merere had recommenced the war with the Wahehe, and to pass from the one country to the other would be impossible. I then thought of going round the seat of war, and thus keep out of Merere's hands; but difficulties again arose. Lake Hikwa would have to be rounded, and then immediately north of it Nyungu was in active operation, so that from Unyanyembe to Nyika the road was closed. To pass by Merere meant a detention of some months; Lake Hikwa could not be crossed; and to go near Nyungu meant that I should have to fight him. Under these circumstances there was nothing for it but to "down helm" and run before the wind with all sails set, with the result of landing me on a route which has now oft resounded under the iron heel of the English traveller—nay, has even shaken under the ponderous weight of the civilised elephant. Still, though driven from my projected scheme, my march from Iendwe has not been by any means valueless. Passing round the south end of Tanganyika, along the shore as far as the mouth of the Kilambo, then striking away about N.N.E. through Ulungu and Fipa, we reached by easy ascents the town of Kapufi, situated in lat. 8° S. and long. 32° 25′ E., and at a height of 5680 feet. Kapufi proved to be a most interesting chief, regarding whom I learned many curious particulars. Unfortunately he is in the hands of a nasty mean Arab.

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* Since this meeting, Captain Carter and Mr. Cadenhead, also of the Belgian Expedition, have met their death, by assassination, as we learn by telegram from Zanzibar.

Best of all, however, while at this place I had the honour to settle the problem of Lake Hikwa, or rather Likwa, and give it some shape and place in our maps. It has run itself, in the hearsay accounts of successive travellers, into various protoplasmic shapes, and, will-o'-the-wisp like, danced about on the map to the tunes of various geographers. I of course saw only a part of it, but from all I could gather it must be from 60 to 70 miles in length and 15 to 20 in breadth. It lies two days east of Makapufi, in a deep depression of the Lambalamfipa Mountains. A large river called the Mkafu — which rises in Kawendi, and which by its tributaries drains the greater part of Khonongo and Fipa, and all Mpimbwe—falls into it. I can almost say with certainty that it has no outlet, certainly not any towards the west. The Kilambo rises near Kapufi.

I was vastly surprised and pleased to find that my bearings and estimated distances, as laid down on my sketch map every two days, have actually brought me within one or two miles of Tabora as laid down by Speke and Cameron. I can hardly, however, call it anything but a curious coincidence.

On my way I had to visit Simba, who has of late been acting as a thorn in the side of the Belgian and French Expeditions. I was received with unusual honour, though I had to turn out a good present.

We came from Iendwe, nearly 300 miles in rectilinear distance, in thirty marches—no slight piece of work you will allow. For nearly half that distance I walked with a most grievous sore on my foot; but I could not rest, and kept going ahead with all haste. The men have also suffered greatly from sore feet, as many as twenty out of our hundred being lame at the same time.

You will be glad to learn that after all our long travelling we were able to make a most brilliant entry into Kwihalah. The day before reaching Simba's, on watching my men file out of camp, they appeared in such a ragged condition that I vowed that at least fifty of the worst should have new cloth to make them look respectable. So to that number I gave out cloth, and they all set to work and made kanzus. To six Kiringosi I gave flaming red johos, and some black joho to others. The order of our procession was as follows:—

1st. A Kiringosi named Ngombe, the butcher, and bully, of our caravan. He wore an immense Mahenge feather headdress, a red joho at his back, and a large leopard skin in front, besides innumerable lemur and monkey skins, cats' tails, &c. He carried an Ubena shield and a huge Manyuema spear.

2nd. The band—a regular rum-tee-tum-tee-tum African drum, a zomiri (which you know is apt to call up native memories by its ear-piercing notes), and a barghumi. The three players had black johos.

3rd. The flag, carried by a boy, and guarded by three of my headmen in ridiculous bandera trousers.

4th. The Kiringosis, clad like Ngombe.

5th. The caravan, all well dressed.

6th. Myself and headmen, the latter also in ridiculous red trousers.

With such a turn-out of barbaric splendour, you may be sure we made quite an impression.

After all this, I have still eight bales left, and two tusks of ivory, which I think will suffice to take me to the coast; but I shall be under the necessity of buying a few good cloths for presents. I have been quite overwhelmed already (I arrived yesterday) with presents, although I have as yet only seen three Arabs—Sheikh and Abdullah Ibn-Nassib, and another—there being few Arabs about Kwihalah—four bullocks, three goats, baskets of fruit, huge dishes of cooked food, &c. The Nassibs are taking quite a fatherly care of me. They have a remark always ready when I protest against their extravagant kindness—"You are under the Governor, and we are under the Governor, so we must do all we can for you," which, Chumah says, means that they consider that the Sultan is under our Government, and that I am travelling under orders from it—an impression, I suppose, derived from knowing that you are interested in and connected with the Expedition.

I find that fourteen of the men I sent back from Ujiji are still here. They have been visiting every European round about, begging for cloth, and telling all sorts of lies. They got five pieces of merikani from the Governor, for which I have given him a note on you.

I expect to leave this place for the coast within six days, if I have not to pass through the apparently inevitable ordeal through which all Europeans have to pass who stop here. If all goes well, I hope to be at Bagamoyo in the middle of July.

All the Arabs express very much astonishment at the road by which I have come, and the distance we have traversed in such a short time, and yet all looking as if we had just left the coast. They quite make me blush at the flattering compliments which they shower on me. The day after to-morrow I have to make the round of the Arabs of Tabora, under the guidance of Sheikh Ibn-Nassib.

I heard at Kapufi that Merere had been fighting with the Wahehe, and had beat them, regaining nearly all his country, and that he had already commenced to rebuild his "big town" Utengula. JOSEPH THOMSON.

P.S.—Sheikh Ibn-Nassib sends his salaam to you, and recommends me to send my salaams to the Sultan, and say that his people, whom I have taken from the coast and travelled a long and unusual road, are now being brought back in health (only one having died). And further to say that I have only good things to speak of them, as they have not deserted me, or stolen my goods, or raised trouble.

To the Secretary of the Royal Geographical Society.

ZANZIBAR, *July 19th.*

DEAR SIR,—I have the honour and pleasure to inform you of the safe arrival of the Society's Expedition at Zanzibar on the 16th instant, in all respects in good condition. As I informed you in my last letter,* we arrived safely at Ujiji, after an arduous journey along the western shore of the lake, during which the only death which I have to chronicle occurred, and I then stated that I proposed to return to my camp at Iendwe, viâ the Lukuga, Urua, Kabuire, and Uemba, and avoid retracing our steps along the lake.

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* Dated from Ujiji, January 12th, and published in the May number of the 'Proceedings,' p. 306.

I understand you have already been made aware of the failure of that attempt—how that after following the Lukuga for five days W.N.W., we struck south-west through Urua as far as the town of Kiyombo, little more than 10 miles from the Congo, where we were compelled to return by exactly the same road to Uguha, feeling very much as if we had got out of a Valley of Death when once more the Lukuga lay between us and the Warua.

The knowledge gained of the people and of the country, however, leaves us no reason to regret having made the attempt, escaping as we did without any more serious loss than that of time.

On getting back to Uguha I was delighted to learn that Mr. Hore was expected every day in his boat (the *New Calabash*), on his way to the southern end. In due course he appeared, and generously put himself to considerable inconvenience to find room for me and my men. Crossing over to the east side, we coasted south as far as Polungo Island, landing here and there, and thus extending my knowledge of the geology and geography of the lake.

At Karema we had the pleasure of meeting Captains Cambier, Popelin, and Carter, who were keeping up their spirits wonderfully, in spite of their somewhat dreary position. From Polungo Island we recrossed the lake to Iendwe, on the Lofu, and to my great pleasure found all my men in capital order, living in a neat and clean little village by themselves.

I cannot speak too highly of the manner in which Chuma had behaved. Though left in charge of everything, he had been only moderately extravagant, as became a "jolly good fellow" who made friends with everybody. A headman like Chuma is a treasure that cannot be valued too highly.

I here learned for the first time, to my inexpressible disappointment, that my projected route to Kilwa was closed by the renewal of the war between Merere and Mamle of the Wahehe tribe; and as long as it lasted, there was no possibility of passing. With regard to this war, I afterwards heard when in Fipa that Merere, in conjunction with the son of the former chief of the Wahehe, had beaten Mamle and recovered the greater part of his country, and was recommencing to build his "big town." At a still later date I learnt that the Wahehe had been defeated on all hands and completely driven out of the whole of the country they occupied when I passed through by Ubena. Under these adverse circumstances I was fain to turn my face in another direction,—back, in fact, to the old beaten track from which I had hoped to keep clear. Till we reached Unyanyembe, however, our route lay through the centre of Fipa and Khonongo, and my observations along that line will, I think, not be without interest. Notably that puzzle of geographers and travellers, Lake Hikwa, about which so much has been heard and which has occupied so many places and shapes on our maps, has been visited.

At Unyanyembe, where I stayed for ten days, I was treated with princely hospitality, more especially by the Nassibs. On the 6th of June I recommenced my march to the coast, reaching Mpwapwa without trouble, and finally Bagamoyo on the 15th July, having come from Iendwe in three months, including all halts. On the 16th we arrived at Zanzibar, where we were received by Dr. and Mrs. Kirk with their characteristic hospitality and kindness. I must also mention that H. H. Sayed Burghash sent my men a present of 200 rupees. I cannot speak too highly of the behaviour and character of my men—of their honesty and faithfulness through all temptations and troubles. I have no instances of stealing or desertions to chronicle, and I am not aware of a single article being stolen from me from the beginning to the end of our journey.

Chuma and my second headman Makatubu have worked like heroes, and I should indeed be but a poor mortal if I did not acknowledge the fact that the success of the Expedition has been to a large extent due to them. Indeed, I can claim to but little merit, as the men were all embued with the idea that I was put specially under their care by the "Baluza" (Dr. Kirk) to be taken carefully and safely round Central Africa, and then returned safely to Dr. Kirk, to whom they considered themselves responsible for my well-being. As I am just following in the wake of this letter, I have not attempted to enter into any details, awaiting more leisure and the advice of competent men before attempting to put much of my work together.

My caravan work has been too much to allow of my making any extensive collections in natural history, but I have still been able to gather a few plants and shells by the wayside, which Dr. Kirk thinks will prove to be interesting and valuable.

I am now occupied in paying off my men and settling all accounts previous to my departure for England, which will be by the mail leaving on the 28th.

Yours obediently,

JOSEPH THOMSON.

Mr. Comber's Journey to the Upper Congo.—The Rev. Mr. Comber writes to us on the 24th of May that he has procured seventeen Krumen from the coast, and, thus reinforced, is about to proceed immediately on his long-delayed journey to Stanley Pool from San Salvador.

Another Belgian Expedition to Central Africa.—A new Belgian expedition was to leave for West Africa during August to reinforce Mr. H. M. Stanley's party on the Congo, which has been considerably reduced in numbers by death and retirement through illness. The new expedition is composed of Lieutenant Braconnier, Sub-Lieutenant Valcke, of the Engineers, and MM. Néve and Van Heste. Some alterations in the arrangements for this expedition were made almost at the last moment, Lieutenant Harou, who was to have been second in command, having been somewhat suddenly ordered on a separate and secret mission to Africa. This will occupy him, it is thought, for about ten months. After the termination of this special mission, he will join Mr. H. M. Stanley and Lieutenant Braconnier on the Upper Congo.

French Expedition from the Senegal to the Niger.—The French expedition under Captain Gallieni, charged with the preliminary survey of the proposed route for a line of railway between the Senegal and the Niger, has met with serious difficulties on its way to Segou-Sikoro, the capital of the friendly Sultan Ahmadu, on the latter river. An account of the journey has been recently communicated to the Geographical Society of Paris by Dr. Bayol, a member of the expedition, who returned to France on the 22nd of July last. With a view to the proposed connection of the French settlements with the Niger, a fort had been constructed last year at Bafulabé, some 70 miles in advance of the old French frontiers, and an extra grant of 1,300,000 francs was voted by the Chamber of Deputies in the early part of the present year for the purpose of constructing another fort at Kita, 155 miles further in advance, which would bring the French possessions within a distance of 150 miles of the Niger. In connection with this was organised the important expedition under Captain Gallieni, which had for its object the establishment of friendly relations with the tribes along the route, and particularly with the powerful chief Ahmadu, for whom presents of considerable value were carried by the party. The expedition consisted of Captain Gallieni, Lieutenants Piètri and Vaillères, Dr. Bayol, and M. Tautain, assistant surgeon. Dr. Bayol was to be left as political agent at Bamaku, a place supposed to be of great importance, on the Niger. Quitting Saint-Louis on the 30th of January, the party arrived, at the end of February, at Bakel. Here the caravan was definitely organised, consisting of 21 Senegal tirailleurs, 7 native sipahis, 12 muleteers, and 60 donkey-drivers, with 20 horses, 12 mules, and 200 donkeys. A final start was made on the 7th of March; leaving the River Senegal at Bakel, the route was thenceforward by land towards the Niger. On the 17th they reached Medina, and on the 30th, Bafulabé, at the confluence of the Bafing and the Bakhoy, where they found the French garrison busily occupied in constructing fortifications. Hence to Kita, where the expedition arrived on the 21st of April, nothing of importance occurred. The country is described as beautiful, but depopulated by the former wars of Hadji-Omar. The chief of Kita and his people proved very friendly, and the necessary concessions for the construction of the projected fort were readily obtained. The site is most picturesque, and of great strategic importance, as the meeting-point of all the roads coming from the Upper Niger to the kingdom of Segou. From Kita Lieutenant Vaillères was detached on a visit to Murgula, a place to the south belonging to Ahmadu. The rest of the expedition continued its march through a luxuriant region towards Beledugu, in the Bambarra country, a district hostile to Ahmadu; and here, for the first time, a hostile disposition on the part of the inhabitants was manifested. Learning that the Europeans were on their way with rich presents for their mortal enemy, the chiefs resolved to attack the party, and an ambuscade was prepared near the village of Dio, about 30 miles from Bamaku, on the 11th of May. Deceived by a treacherous guide, the expedition narrowly escaped being led into a thicket where the whole Beledugu army, 2700 strong, lay concealed. The treachery was discovered in time, and the guide shot. Captain Gallieni then, abandoning his convoy, formed his 30 combatants in column, and forced his way fighting towards Bamaku. Nearly half the effective force of the expedition was killed or wounded, and all the baggage animals, with their loads, to the value of more than 150,000 francs, were captured by the enemy, who, however, lost heavily, to the extent, as it afterwards transpired, of 48 killed and 80 wounded. The French lost many horses by drowning in crossing a tributary of the Niger at the end of the fight; of the treasure carried by the expedition, only 5000 francs remained. Bamaku, on their arrival at this place, was found to be no longer a place of any size or importance, and the people were unfriendly. It is now a mere village of some 700 or 800 inhabitants. Lieutenant Vaillères having here rejoined the party, the march was continued up the left bank of the Niger to Nafadié, where Dr. Bayol quitted the expedition (the state of affairs at Bamaku not permitting his special mission to be carried out) and returned to Senegal. His return journey, without funds or stores, was full of difficulty. He travelled by way of Manding, which he describes as a rich and beautiful country; passed by Bouré, widely known for its gold-mines, and visited Kumakhana, where he saw a large number of gold-diggings; and reached Bafulabé on the 30th of May. On the 6th of August news reached Paris that Captain Gallieni, with his party, having crossed the Niger on the 17th of May, to the right bank, had reached Segou-Sikoro in safety. The geographical results of the expedition so far have been of considerable importance. The valley of the Ba-ulé and that of the Bakhoy have been thoroughly explored, and new and rich districts visited; and various rectifications made in Dr. Mage's map, especially with regard to the true course of the Ba-ulé, a large river near Bamaku, communicating with the Niger by a lagoon in the rainy season.

Italian Explorers in Africa.—A letter has reached Italy from Lieutenant Massari, Dr. Matteucci's scientific coadjutor, giving later information respecting the movements of the expedition than that published in our last number (*ante*, p. 507). Lieutenant Massari states that the authorities and others at El Obeidh, the capital of Kordofan, who had previously furnished information regarding the condition of the country, on hearing of Dr. Matteucci's intention to proceed to Wadai, all united in assuring him that there was no longer any road open through Darfur, and that the natives were of the worst possible description. On arriving at El Fasher, the capital of Darfur, however, the party found a number of pilgrims from the frontiers of Bornu, and even from Timbuktu, on their way to Mecca. Communication, therefore, was clearly possible, and the choice lay between Dr. Nachtigal's route in 1873, viâ Kobe and Kabkabia, and another. Dr. Matteucci and Prince Giovanni Borghese left for Kobe, of which Signor Francisco Emiliano is governor. They were afterwards accompanied by him as far as Kabkabia, two days' journey to the west of Kobe. Lieutenant Massari hoped to rejoin the expedition shortly at Kabkabia, where they intended to remain for some time for the purpose of studying the country and its inhabitants, while awaiting the return of a messenger, whom they had despatched with letters to the Sultan of Wadai. They intended eventually to cross the frontier at Kolkol.

Routes between Kurram and Ghazni.—Lord Hartington's recent remark that possibly the Kurram Valley might be found to serve as a better base of operations to a force advancing from Kabul to Candahar than Kabul itself would, will suggest to geographers that we really know but little of the routes leading from the Kurram Valley into the Kabul-Candahar road. The chief route is the ordinary one leading over the Shutargardan Pass and joining the Logar River at Hissarak, from whence it ascends the river as far as its junction with the Shiniz stream, along a valley studded with walled villages, where there is abundance of cultivation in the vicinity of the irrigation canals, and where the edges of the watercourses are thickly planted with rows and groves of willow and poplar. This was the road followed by the Lumsden Mission in 1857, and it joins the great route between Kabul and Ghazni, a little west of the village of Doaba. It is of course very fairly known from their survey. The great bend which this road makes near the junction of the Shiniz and Logar streams is saved by a direct road which leaves the main one at Amir Killa, and diverging to the south-east, passes through the village of Chillozan, and over the Sirkawand or Sugawand Pass (Sujaon of Wilson's map). This route is mentioned by Lumsden, who says that Ghazni could be reached in one day by it, and that the pass, though difficult, is practicable for horsemen. Major Raverty, however, tells us that the Sugawand route from Ghazni to India was frequently used by the first Mohammedan conquerors of India in preference to any other, and that there was once a great fortress on the top of the mountain, and in more recent times a famous Hindu idol temple, called the Temple of Sugawand, whither pilgrims from all parts of Hindustan used to resort. It would be well worth while for Sir Frederick Roberts to despatch a survey party to examine this route. But the best route between the Kurram Valley and Ghazni is said to be the continuation of the Thal one along the banks of the Kurram past Keraia, through the Chakmanni country by Lajhi to Ahmed Khel, thence up the Ghunzai or Surki river, over the kotal of that name, and so on to Ghazni. Unfortunately it runs through the unfriendly Mangal country, and has a bad name on account of the robbers which are known to infest it. There is a branch road diverging from this route on the right hand, and leading over a kotal or pass, called Altimor and Tera Gawi, into the Logar Valley and to Kabul, and it was by this road that Mahomet Azim Khan, the old ruler and builder of Kurram Fort, brought the guns to Kurram. Further south again there is a third route from Kurram to Ahmed Khel, leading over a pass surmounting the water-parting between the Kurram and Jilgu rivers. This one joins the previously mentioned route passing through the Mangal country. Of the three mentioned roads between Kurram and Ghazni, the last two have never been surveyed, but they are certainly more direct than the Shutargardan road, and it is more than probable that in each case the passes to be crossed are of considerably less altitude, and thus would be more accessible in winter.

Colonel Prejevalsky.*—In June last the Imperial Russian Geographical Society received from Colonel Prejevalsky three letters, detailing the incidents of his journey from Su-chow towards Lhassa, and his subsequent return march to the Chinese city of Si-ning. Having failed to procure a guide for more than 10 miles from Su-chow, he adopted the plan of sending forward two mounted scouts from time to time in advance for distances of 60 or 70 miles, and the expedition was thus able to make good progress. On one of these reconnaissances two Mongol hunters were brought in, who guided the expedition to the nearest Mongol encampment at Syrtyn, in Tsaidam. The mountainous region south of Su-chow was explored to a considerable extent, and two snowy ranges were discovered, to which the names of Humboldt and Ritter were given. In this region there are no forests, the flora and fauna are extremely poor, and many abandoned gold-diggings were met with. By the aid of a guide furnished by the Syrtyn Mongols, Colonel Prejevalsky found no difficulty in reaching Koorlyk, a distance of about 180 miles, but he met with many obstacles on the road thence to Dzoon Zassak, where again no guides could be obtained. From the post of Zaisan to the foot of the Burdan Booda Range at Dzoon Zassak the distance was 1370 miles; the whole country traversed is described as a desert with the exception of occasional oases of vegetation, and forest land was only once met with on the Tien-Shan; few animals and flowering plants were observed, and the natural history collections made were consequently not large. The topographical, barometrical, and meteorological observations secured, however, were important, and a number of positions were determined astronomically; thus accurate data have been obtained for mapping a large extent of country previously entirely unknown. Having two assistants on this journey, Colonel Prejevalsky has had more time for keeping a detailed journal, and one of his companions has made seventy drawings for the illustration of the future narrative of the expedition. A guide was obtained at Dzoon Zassak, and Colonel Prejevalsky started on the road to Lhassa, but was taken in the wrong direction to the upper waters of the Blue River. He accordingly dismissed his guide, and proceeded onwards as best he could, but fortunately soon found the road, and crossing the Blue River reached the Tan-la Plateau, an elevated region crowned by an immense snowy range 16,800 feet in height. The ascent was steep, and rendered painful by the rarefaction of the atmosphere; the difficulties of the march were further increased by the snow which covered the whole of the plateau, and which falls in Tibet as early as the middle of October. The expedition was attacked by nomads in the Tan-la Pass, but succeeded in beating them off, and directed their course towards Lhassa. At the village of Nabchu, however, 180 miles [? versts] from the capital, they were encountered by a body of Tibetans, who refused to allow them to pass without permission from the Government. The matter was referred to Lhassa, but without success, and Colonel Prejevalsky was reluctantly compelled to turn back, obtaining from the Tibetan authorities a written statement of the reasons why he was not allowed to proceed to Lhassa. The return journey from Nabchu to Tsaidam occupied two months, and was rendered very trying owing to the winter storms encountered and the great elevation of the region traversed (14,000 to 16,000 feet). During the time spent in Tibet a considerable collection of animals was made, including two very large yaks, but the ornithological booty was poor, birds being scarce in the Tibetan desert. After visiting Koko-Nor, Colonel Prejevalsky arrived at Si-ning on March 19th to make arrangements for exploring the upper course of the Yellow River. He intended to spend three or four months there, and then to return home by way of Alashan and Urga.

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* From a translation of Colonel Prejevalsky's letters by M. Alexis Lomonossof, F.R.G.S., Assistant Secretary of the Imperial Russian Geographical Society.

Russian Manchuria.—In urging the advantages of Vladivostock as a health-resort in summer for residents in China, a correspondent of the 'North China Herald' furnishes some interesting particulars as to the route thither from Japan. At Vladivostock, he says, there is a summer temperature of 65° F., glorious mountain air and scenery, and waving forests of oak, beach, and pine. From Nagasaki the route is along the Japanese coast, close to the beautiful islands Hirado, Ikutski, and Iki. From the last named to Dagelet (Mata-shima of the Japanese) the course is N. 18° E. for about 230 miles, to the east of Tsu-shima, in the strength of the Kurosiwo. Dagelet is a beautiful island, wooded to the summit of its highest peak, which rises to a height of 4000 feet above the sea. It is uninhabited except in summer, when a few Coreans go there to build junks. From Dagelet the course is due north for 340 miles to the island of Skryplef, whence the port of Vladivostock is about six miles distant. The soil of Russian Manchuria is described as exceedingly fertile: timber of the best quality exists in abundance, as well as gold, coal, iron, and other minerals; the neighbouring sea teems with fish, and the reefs are covered with edible seaweed. From Arkold to St. Vladimir Bay there are numerous fairly good harbours, several of which are quite sheltered. The climate is healthy, though the winters are severe.

Saghalin Island.—Some interesting information regarding Maucka Cove, on the west coast of this island, has been recently communicated to the Hydrographical Office by Mr. G. C. Anderson, commanding the S.S. *Appin*. Maucka Cove (lat. 47° 3′ N., long. 142° 6′ E.) is the headquarters of a company which has acquired from the Russian

Government the right to collect along the sea-coast seaweed, bêche de mer, fish, &c., for a period of ten years. The Cove is about two cables in length east and west, by one cable in breadth, and is said to be the safest anchorage in this part of the island. The population consists of three Europeans, a small guard of seven Russian soldiers, and about 700 coolies, consisting of Ainos, Coreans, and Chinese. The Ainos are praised as excellent hunters and as a quiet, good-natured, hardy race. The climate is fine but cold, the summer temperature not exceeding 60° Fahrenheit, and falling at times to 24° below zero in winter. Fine weather prevails from May to the autumnal equinox, when it breaks up. In June and July dense fogs prevail, with occasional strong east and south-east winds which bring rain from the hills; during these months there is often a clear belt along the coast, free from fogs, extending four or five miles off shore. There is an abundance of fine timber in the valleys—yellow pine, cedar, spruce, ash, and oak, and spars of any size can be obtained. Coal crops out about a mile inland from the Cove, and indications of iron have also been noticed. Bears, hares, grouse, and, in winter, sables and fine foxes are plentiful, and fish — herring, cod, salmon, trout, and flounders — is abundant. Communication with the east coast of the island is kept up by means of dog-sledges, which the Ainos are expert in driving. There are about a dozen trading-stations on the west coast, south of Maucka Cove, each of which has its mountain stream and settlement of Koreans and Ainos, who work for the European traders.

Memorial to the late Mr. A. R. Margary.*—The memorial, subscribed for by foreign residents in China, to our late Associate, Mr. A. R. Margary, of Her Majesty's Consular Service, who was murdered near Manwyne, in Yünnan, in February 1875, was unveiled at Shanghai on June 10th by the Hon. T. G. Grosvenor, C.B., Secretary of Her Majesty's Legation at Peking, who was at the head of the mission afterwards sent to inquire into the circumstances attending Mr. Margary's death. The memorial is 37 feet high, and in the Gothic style, from the designs of a Shanghai architect. The large carved cup and four lions on the base were executed by Messrs. Farmer and Brindley, of Westminster Bridge Road, who received their instructions from Mr. Kidner, of Old Broad Street, formerly of Shanghai. When the memorial is completed, stone steps will surround the base, which is of Ningpo greenstone, and from which rise a column and four shafts with trefoil arches and ornamental gablets, each containing a shield, on which are to be placed the arms of the Margary family and the Shanghai Municipality. At the base, between the shafts, are the four lions above mentioned, while the whole is surmounted by a spire and a wrought-iron cross. The following inscription, which was read by Mr. Grosvenor, will eventually appear on a bronze plate on the front of the base:—

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* We are indebted to the 'North China Herald' for most of the particulars in this note.

> In Memory of Augustus Raymond Margary, of Her Majesty's Consular Service in China. Already awarded the Albert and Royal Humane Society's Medals for his conspicuous gallantry in saving the crews of three vessels wrecked during a typhoon at Kelung, in Formosa, he was chosen in 1874, by Her Majesty's Minister, to cross China alone, to meet and guide an Expedition, having for its object the opening of a Trade Route between that country and Burmah. After safely accomplishing this journey, he was murdered on his return, near Manwyne, in Yünnan, on the 21st February, 1875. Aged 28. This Monument is erected by foreign residents in China as a token of their esteem for the friend whom they have lost, and of their appreciation of the services which he rendered.

Full particulars respecting Mr. Margary's life and ill-starred journey will be found in Major-General Sir Henry C. Rawlinson's Presidential Address for 1875 ('R. G. S. Journal,' vol. xlv., and 'Proceedings,' vol. xix.), while his own diary and letters are published in the 'Proceedings,' vol. xx., and in the 'Journal,' vol. xlvi.

The Indo-Chinese Peninsula.—In his report on the trade and commerce of Saigon and Cochin-China in 1879, Mr. C. F. Tremlett, Her Majesty's Consul at Saigon, continues his useful notes on the Indo-Chinese Peninsula, to which we referred last year,* dealing on the present occasion with the Annamese and their country. The inhabitants are described as being of a light olive complexion as a rule, and presenting something of the appearance of Mongols, but the race is nevertheless quite distinct, and would not be confounded, even by strangers, with any of its neighbours. The people are of uniform height, well made, and commonly have finely-shaped heads; the nose is short, and the eyes and hair black. The hair is worn long and full by both men and women, and is gathered into a complicated knot. The dress of both sexes is much alike, and consists of a long robe and trowsers; the men wear a black turban, artistically arranged. The habitations are usually of wood, bamboo, and palms, with mud floors, and sometimes mud walls; some of the richer natives, however, have brick houses, roofed with tiles. Only one language prevails throughout the entire kingdom, but the characters used in writing are Chinese.—Little is at present known with regard to the geology and mineralogy of the country. The principal mountains are composed of granite, and those of Tong-king are the richer in metals. In them are found gold, silver, and iron; copper and zinc are also met with. In regard to the physical features of the country, a chain of mountains, the continuation of the range which runs through Tibet and the Chinese provice of Yünnan, separates the kingdom of Annam from the valley of the Mei-kong, but in this region its elevation is not great; another chain meets the sea at Hatien, and terminates the Elephant Range of Cambodia. The coast southward from Cape St. James to Pulo Obi is very low, and can only be seen a short distance to the north. It consists of a succession of capes of moderate elevation, which increase in height with the latitude. They form a large number of bays, of which the principal is Quin-ghon, Chin-ghon, Phau-ry, Man-tong, Ko-he, and Ban-lan, but they all have several designations.—Mr. Tremlett also furnishes some notes respecting the meteorology of Annam, his remarks applying equally to French Cochin-China. The prevailing winds are north-east from October to April, and south-west during the rest of the year. The dry season corresponds with the duration of the north-east winds. The seasons are usually regular, but in those years in which the rains are late a material increase of sickness is observable. The worst months of the year are April, May, and June, when the heat is most oppressive. During July and August the rains diminish, becoming heavier again in September. The rainy season is characterised by frequent thunder squalls of great violence, as many as fifty-eight having occurred during a single month. Lower Annam is beyond the region of typhoons, but is occasionally visited by one.

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* Vol. i. p. 391.

Mr. Whymper's Second Ascent of Chimborazo.—Mr. Whymper, in a letter dated July 13th from Guayaquil, informs us that he made a second successful ascent of Chimborazo on the 3rd of that month. His previous ascent was from the south, this time it was from the north-west. His party started from their camping-place (alt. 15,950 feet) at 5.15 A.M., arrived at the summit about 1 P.M., remained there one and a half hours, and returned to the camp by 5.10 in the evening. This, he says, proved a much better route than that followed on the former occasion. During the ascent, Mr. Whymper witnessed a grand eruption of Cotopaxi, 60 miles off. It commenced at 5.40 A.M., and at 1 o'clock ashes began to fall—so thickly that the summit of Chimborazo "looked like a ploughed field." The party finished by making a complete tour of Chimborazo at a height of 1200 to 1500 feet. Previous to this last achievement, Mr. Whymper made the ascent of Carihuairazo, and a journey to Altar, thus completing, as he states, the whole of the work for which he came to Ecuador. He was detained, at the time of writing, at Guayaquil, owing to the non-arrival of part of the collections he had made in the interior, which include, besides natural history and mineralogical specimens, a valuable series of Inca antiquities.

Affluents of the Purûs.—Writing from São Pedro de Caxoeira on April 30th, Mr. Resyek Polak has sent to the South American Missionary Society an account of his expedition to some of the affluents of the Rio Purûs, to which reference was made on p. 369. The party started on March 19th in the steam launch *Pioneer*, and first visited the Mamuriá tributary (W. long. 66° 18′, S. lat. 7° 30′), on the left bank of the Purûs, about 890 miles from its embouchure. The Mamuriá takes its rise in the *terra firme*, towards the Juruá affluent of the Amazons; its mouth in

March is about 50 yards broad; its water, naturally of an inky hue, is then kept in abeyance by the superior rise of the Purûs, whose turbid and clayey water supersedes it for some furlongs inland. Its length is not known, as no intelligent person has yet reached its source, about which dwell the Jamamady tribe. The Indians of the Pamary tribe, so sparsely scattered all along the middle Purûs, are not found above the Mamuriá, and their place is to some extent taken by the Hypurinas for about 225 miles; these in their turn disappear, and are replaced by another tribe, and so on, till the sources of the Purûs are reached. Mr. Polak, however, remarks that, as a rule, from the mouth of the Purûs for more than 1000 miles up the river, Indians are not found on its banks, with the exception of a very few Pamarys and Hypurinas. They are afraid of coming into contact with civilisation, and therefore dwell far in the interior among gloomy forests. On the right of the Purûs, an hour's steaming from the Mamuriá, there is a lake, named Ajarahan, which Mr. Polak had visited in 1875. He now took the *Pioneer* in by means of an *igarapé*, and soon came upon the *jangadas* of the Pamarys, which he had not seen before. *Jangada*, he says, means a raft, or a collection of trunks of trees lashed together, which serves either as a habitation on the water or as a means of conveyance from place to place. The Pamarys and their ancestors from time immemorial have always lived on these rafts, in consequence of a tradition of their having escaped by such means from a universal deluge. Mr. Polak does not appear to have been very successful in his attempt to open intercourse with the timid Pamarys, and shortly afterwards resumed his voyage up the Purûs, arriving at Caçantuá, beyond the mouth of the Ciriwené tributary, on April 2nd. Caçantuá is properly the name of the lake emptying into the Purûs, opposite Lake Ianripuá. The lake is of a peculiar formation, describing a gigantic loop, in the centre of which is a large island. Mr. Polak next ascended the Purûs to the Chiwené, which rises in a similar direction to the Mamuriá; its banks and the deep glades of its gloomy forests are peopled by Indians of the Hypurina and Jamamadys tribes. The water of the Chiwené is olive-coloured, and superior in every respect to that of the Purûs; it abounds with fish of several kinds, and game is plentiful on its banks. Along this river there are both *terra firme* (land high above the water-level) and *varzea* (land occasionally flooded at high water, but never to any depth). The mouth of the Chiwené in April is not always safe to enter from across the Purûs, its waters being turbulent and full of whirlpools. The *Pioneer*, however, was taken safely in, and a short run was made up the river. It had been intended that, after his visit to the Chiwené, Mr. Polak should have continued up the Purûs to visit a tribe called the Manetiniri, of which good accounts have been received, or else go to the Uakiri, the largest affluent of the higher Purûs, in search of Hypurinas, who are believed to exist there in large numbers. These plans, however, were unfortunately frustrated by the failure of Mr. McCaul's health, and the necessity for repairs to the engine of the *Pioneer*, and he was compelled to return to São Pedro on April 19th. As soon as the steam launch had been put in order, the Rev. W. Thwaites Duke, superintendent of the station, intended to start in her on another expedition up the Purûs.

Servia, its Inhabitants and Products.—According to a report to the Foreign Office from Her Majesty's Vice-Consul at Nisch, dated March 20th, 1880, Servia, including the territory annexed to the principality under the Treaty of Berlin, has an area of about 19,000 square miles, or nearly two-thirds of the area of Scotland. Of this area about 2,000,000 acres only are under cultivation, i. e. about one-sixth against one-fourth in Scotland. Of the remaining five-sixths a considerable portion is also capable of cultivation, while the rest consists of inaccessible mountains and of forests and rocky ground too poor to pay for cultivation, of which latter a large proportion is in the mountainous district of Ushiza. The valleys of Servia have an alluvial soil of great depth, often over six feet, and it is nearly, if not quite, as fertile as that of Wallachia. The hill-sides, especially those with southern aspects, grow grapes of great excellence, and often tablelands are to be found high up among the hills, which grow excellent wheat and maize. The land at present under cultivation is divided as follows:—Arable, 1,150,000 acres; orchards (chiefly plums), 155,000; meadow land, 610,000; vineyards, 85,000. The population is about 1,750,000, of whom about nine-tenths are peasants living entirely by agriculture. The peasantry may be divided into two classes, the old and the new. The peasant of the old school lives and cultivates his land in the most primitive manner possible, while the peasant of the new school is, as the result of the national system of education, more advanced in his ideas. The manufactures of the country are simple and limited, and consist chiefly of cotton and flax spinning by hand, and the weaving of cotton, linen, and woollen cloths by hand-looms, and the weaving also by hand-looms of woollen and goats' hair carpets. Servia is rich in copper, lead, and other ores, and also in coal, but, owing to difficulties of transport and other causes, they have never been worked with so much success as their quality and quantity would seem to promise. It is expected, however, that when the railway is completed, these mines will prove a source of great wealth. The country abounds still in immense forests of oak and other trees, but they are suffering from bad treatment, for, Mr. Baker remarks, it would be a misnomer to call it management. At present the peasants, when they want wood for repairs or for fuel, fell twice as much timber as is required, and without any regard to the question what trees ought to be felled and what ought to stand. Under this treatment many forests have already disappeared, and should it be continued, the disappearance of the remainder is only a question of time.

CORRESPONDENCE.

M. Oshanin's Explorations in Hissar and Karateghin.

Tashkent (Turkestan, Russia),
Sericultural School,
17th (*29th*) *February*, 1880.

In the September number of the 'Proceedings of the Royal Geographical Society' for 1879, you have inserted an account of my route through Hissar and Karateghin to the head-waters of Muk-su. In this article there occurs a misspelling of a name which, if I do not err, is to be found in the same erroneous form on all English maps of Central Asia. I mean the river which you spell Khuliab. Its name, as you will find on all Russian maps, is *Khullas* (here the *kh* stands for the German *ch*, and all the vowels must be pronounced as in German). After Muk-su, it is the greatest of all the tributaries of the Surkhab; its valley is bordered on the north by the Emperor Peter I.'s Chain, and on the south by another range, for which I propose the name of Darwas Chain. I have not seen this latter, but I have gathered some information about it. It divides the waters of Khullas from the rivers Wandjab and Panj, and seems to be very high.

I believe the Khullas River springs from the western and southern slopes of four magnificent peaks, which rise some 30 versts to the west of the confluent of Muk-su with the Surkhab, and which by my estimate are from 20,000 to 24,000 feet high. The valley of the Khullas has a general direction from east to west, and only in its lowest course the river makes a sudden bend to the north, intersects the northern chain through a deep and narrow gorge, and joins the Surkhab near the Karateghin village of Langar, some 50 versts below Gharm.

The Khullas Valley is said to be well peopled, and to have formed one of the most valuable parts of the Darwas Shah's dominions. In the year 1878 it was conquered, as well as the rest of Darwas and all Karateghin, by the Emir of Bokhara, and since that time it has been under his rule. There are three fortresses in this valley, namely, Chil-darah, Tabi-darah, and Ishtiun, all situated on the banks of the river. I have heard of two bridges on the Khullas, one near the village of Pashal, and the other near Tabi-darah.

The passes that lead from Karateghin in the Khullas Valley are three in number; they are (going from west to east) (1) Kamchirak, leading from Gharm to Chil-darah; (2) Luli-Kharvi, on the road from Khaït to Ishtiun; and (3) Gardani-Kaftar, that leads from Zanku to the sources of Khullas.

I cannot close this letter without mentioning an error which is repeated on all Central Asian maps. On all of them which I have seen the Surkhab is shown as making a sudden bend, and as flowing from north to south between Kichik-Karamuk (Little Karamuk) on our frontier and the mouth of Muk-su. This bend does not exist in reality, and the Surkhab has a general direction from E.N.E. to W.S.W.

B. Oshanin.

To the Editor of the 'Proceedings R. G. S.'

PROCEEDINGS OF THE GEOGRAPHICAL SECTION OF THE BRITISH ASSOCIATION.

SWANSEA MEETING, 1880.

The British Association for the Advancement of Science held its annual meeting, the fiftieth, this year at Swansea, from the 25th of August to the 1st of September. The Geographical Section was organised as follows:—

PRESIDENT:—Lieut.-General Sir J. H. Lefroy, C.B., K.C.M.G., R.A., F.R.S.

VICE-PRESIDENTS:—Sir Henry Barkly, G.C.M.G., K.C.B., F.R.S.; Francis Galton, F.R.S.; Admiral Sir Erasmus Ommanney, C.B., F.R.S.; Lieut.-General Sir H. E. L. Thuillier, C.S.I., R.A., F.R.S.

SECRETARIES:—H. W. Bates, Assistant Secretary R.G.S.; E. C. Rye, Librarian R.G.S. (*Recorder*).

The President opened the business of the Section, on Thursday, August 26, with the following Address:—

MY recent predecessors in this chair have dealt, with a knowledge and ability with which I cannot vie, not only with great problems in terrestrial physics, such as the genesis of our oceans, continents, and mountain chains; the circulation of the waters of the ocean, with its consequences on climate; the reciprocal influence of conditions of nature upon man, and of man's ability to modify those conditions; but also on the progress of geographical discovery on the great theatres of political interest or commercial rivalry; and the archæology of our science, as regards Asia, has been touched by a master's hand. Turning, then, from themes on which I could offer nothing worthy of your attention, I find with a sense of relief, that there is a region of the globe, and it is one with which I have the most personal acquaintance, which has received very little attention at their hands. I refer to the great continent of America, and more especially its northern portion; and I hope for your indulgence if I enlarge a little upon that theme.

How vast have been, in very recent times, the additions to our knowledge in that quarter, how continuous is the progress of discovery, cannot, I think, but worthily occupy your attention for a few minutes. In other regions geography is the pioneer of civilisation and commerce. We look, and often look long, for their footsteps to follow. Here for the first time she has been outstripped, for the telegraph and the railway have tracked the forest or prairie, and traversed the mountains by paths before unknown to her.

I remember that patriarch of science, Sir Edward Sabine, once telling me how eagerly he, as a young man, had desired to retread the footsteps of Lewis and Clarke, whose journey from St. Louis to the Pacific in 1805, was at the time, and must long remain, one of the most remarkable geographical achievements on record.

Let me, then, remind you that within living memory (I grant a long one) no traveller known to fame had crossed the American continent from east to west, except Alexander Mackenzie, in 1793. No traveller had reached the American Polar Sea by land, except the same illustrious explorer and Samuel Hearne. The British Admiralty had not long before instructed Captain Vancouver to search on the coast of the Pacific for some near communication with a river flowing into or out of the Lake of the Woods. The fabulous straits of Annian are to be found on maps of the last century. "The sacred fires of Montezuma" were still burning in secluded valleys of Upper California when her Majesty ascended the throne.

It is very interesting to observe that De la Hontan, whose name has been recently given by the American geologists to the basin of the great Miocene Sea, now represented by Carson Lake in Nevada, ascended the Mississippi, and even penetrated up the Yellowstone, very nearly to the "National Park," at all events into the present territory of Montana, so early as 1687. He introduces into his rude map a head-water lake, on Indian information, which must, I think, be identical with a lake in that reserve. "Je sçais," says his biographer, "que tous les voyageurs sont sujets à caution, et que s'ils ne sont point parvenus au privilége des poëtes et des peintres, il ne s'en faut guère: mais il faut excepter de la noblesse; est-il croyable qu'un baron voulut en imposer?" But I am not pursuing the attractive theme offered by historical geography, and must not dwell on the memorable expeditions of Franklin and Richardson, of Back and Simpson and Rae, but proceed to point out the many agencies at work of late years to open up the continent: the military operations, for example, of the United States Government against Mexico; the discovery of the precious metals; the explorations for the Union Pacific and Canada Pacific Railways; International Boundary Surveys; the geological surveys of the American and Canadian Governments. These have all resulted in a surprising extension of geographical knowledge, without any of them having it particularly in view. It was a bold figure of speech of Lord Dufferin's which described the Rocky Mountains in 1877 as being nearly "as full of theodolites as they could hold," but the Dominion Government has spent about three-quarters of a million sterling on explorations or surveys for their railway, and we have only to glance at a recent map to discover nine sovereign states, and seven territories, west of the Mississippi, bounded by right lines, which neither war nor diplomacy has determined, laid out like garden-plots, to see that neither Asia nor Africa have unfolded more of their secrets in our times, than has the nobler continent where Britain has cast her swarms.

The thoroughness characteristic of the scientific operations of the American Government has been greatly favoured by the physical features of the region of their trigonometrical survey, in the American Cordilleras. Sharp, rocky peaks, bare of vegetation, rise to altitudes of 10,000 to 12,000 feet, at convenient distances of 60 to 80 miles apart, so situated as to form well-conditioned triangles, while the purity of the atmosphere makes observation easy. In this manner has an immense region, comprising some 87,000 square miles in Nevada, Utah, and Colorado, been topographically surveyed since 1867; not indeed with the detail of a European national survey, but with all the accuracy required for first settlement. The two prehistoric seas now designated Lake Bonneville, of which Salt Lake is the remains, and Lake La Hontan, already referred to, have been defined, and facts of remarkable physical interest have been ascertained. The evaporation of Great Salt Lake, for example, is no longer in excess of its annual tribute; it has risen 11 feet since 1866. The natural basin of Pyramid Lake is now full, its level has risen 9 feet, and the overflow is filling up Winnemucca Lake in like manner; the latter lake has risen 22 feet, and its area has doubled within the same short period. We cannot allow the geologists to monopolise the interest of these physical changes, which the magnificent volume of Mr. Clarence King has presented to them.

Lying a little to the east and south of the region just referred to is another, which includes yet loftier mountains, and has been surveyed by Professor Hayden. Here, on the tributaries of the rivers Colorado and S. Juan, we find those mysterious monuments of an extinct civilisation and a dying people, the cliff-houses on the Rio Mancos and Rio de Chelly, the Pueblos of the Chaso Cañon; and here the wandering Apaches still practise on their prisoners those revolting and indescribable cruelties which make humanity shudder, and which seal their doom of extermination. No less than eighteen summits in the Sierra Blanca have been found to rise above 14,000 feet. Blanca Peak, in South Colorado, attains 14,464 feet, and is the monarch of mountains, if such there may be, in the Great Republic. Lake Tahoe, the largest of Western lakes, familiar to readers of the brilliant pages of Miss Bird, was surveyed by Lieutenant Macomb in 1877, and the height of Pyramid Peak ascertained to be 10,003 feet. A town of 20,000 inhabitants (Leadville, Colo.) has sprung into being at an elevation of 11,000 feet, which ranks it among the highest inhabited places on the globe.

Very different in their character are the survey operations of the Canadian Government in the north-west, where the problem presented is to prepare a vast territory, wholly wanting in conspicuous points, for being laid out in townships of uniform area, and farms of uniform acreage. The law requires that the eastern and western boundaries of every township be true astronomical meridians; and that the sphericity of the earth's figure be duly allowed for, so that the northern boundary must be less in measurement than the southern. All lines are required to be gone over twice with chains of unequal length, and the land surveyors are checked by astronomical determinations. In carrying out this operation, which will be seen to be one of great nicety, five principal meridians have been rigorously determined, and in part traced—the 97th, 102nd, 106th, 110th, and 114th; and fourteen base-lines, connecting them, have been measured and marked. One of these, on the parallel of 52° 10′, is 183 miles long. Eleven astronomical stations have been fixed since 1876, and from these sixty-six determinate points have been fixed in latitude, forty-five in longitude, often under conditions of no little difficulty from the severity of the climate. The claims of Messrs. Alexander and Lindsay Russell, of Mr. Aldous, and Mr. King, the observers, to rank as scientific travellers, will, I am sure, be warmly recognised by this Section.

The sources of the Frazer River were first reached in February 1875, and found in a semicircular basin, completely closed in by glaciers and high bare peaks, at an elevation of 5300 feet. The hardy discoverer, Mr. E. W. Jarvis, travelled in the course of that exploration 900 miles on snow-shoes, much of it with the thermometer below the temperature of freezing mercury, and lived for the last three days, as he expresses it, "on the anticipation of a meal at the journey's end."

We are still imperfectly acquainted with the region north of the parallel of 50° in British Columbia, where the Canadian engineers have long been searching for a practicable railway line from one or other of three known passes of the Rocky Mountains proper, through the tremendous gorges of the Cascade Mountains, to the Pacific. These passes are, the Yellowhead, at an elevation of 3645 feet, the Pine River, at 2800 feet, and the Peace River, said to be only 1650 feet above the sea, all of them comparing very favourably in respect to height with the other trans-continental railways. The Union Pacific Railway, for example, runs, as you will remember, for 1500 miles at elevations of over 4500 feet, and its summit level is 8242 feet. The Dominion Government has recently adopted a line from the Yellowhead Pass to Burrard Inlet, which may be made out in any good map by following the course of the Thompson and Frazer rivers. By this line the Pacific coast will be reached in 1945 miles from Lake Superior, and it is already partly under contract. This is not a place to enter upon engineering details. I will only remark that greater difficulties have seldom been presented to human enterprise than must here be conquered. That peculiar feature in physical geography, the cañon or deep gorge, of which the Via Mala is an example familiar to European travellers, is presented all over the region upon a scale of grandeur unsurpassed. When not perpendicular cliffs, their sides are in these latitudes seamed by avalanches on the grandest scale; while the mountain torrents which rush down them defy navigation. Mr. Jarvis describes how on one occasion having walked into a hole concealed by snow, the current caught his snow-shoes, turning them upside down, and held him like a vice, so that it required the united efforts of all his party to extricate him.

There is a curious circumstance mentioned in this gentleman's narrative which deserves notice, as an instance of the successful reduction of a native language to writing, free from the difficulties which attend the use of the Roman alphabet. He met with a kind of notice-board or finger-post at the dividing of two tracks on the prairie, having upon it characters which were entirely unknown to himself and his companions, and apparently to the Railway Department:—

ᐅᒪ ᒣᐢᑲᓇᐤ ᐯᐦ ᐅᓇᓃ ᐁᐃᑕ ᒨ ⟶

They are, in fact, characters of a phonetic alphabet, invented forty years ago by a Mr. Evans, a Wesleyan missionary among the Cree Indians, and are extremely well adapted for expressing their liquid, polysyllabic language. That they should have survived the generation to which they were first taught, and be still used for communication on the plains, is a fact which would have given great gratification to their excellent author.*

The final decision of the Canadian Government to adopt Burrard's Inlet for the Pacific terminus of their railway, relegates to the domain of pure geography a great deal of knowledge acquired in exploring other lines: explorations in which Messrs. Jarvis, Horetsky, Keefer, and others have displayed remarkable daring and endurance. They have forced their way from the interior to the sea-coast or from the coast to the Peace River, Pine, or Yellowhead passes, through country previously unknown, to Port Simpson, to Burke Channel, to the mouth of the Skeena, and to Bute Inlet, so that a region but recently almost a blank on our maps, which John Arrowsmith, our last great authority, left very imperfectly sketched, is now known in great detail, and I regret to add, the better known, the less admired. The botany has been reported on by Mr. Macoun, and the geology by Dr. Dawson, *pari passu* with its topography. I have great hope that the Section will receive from the last-named traveller in person some account of his many arduous journeys in the prosecution of geological research. Of these, the latest is the exploration of Queen Charlotte Islands, a part of the British possessions very little known to most of us, although we had a communication on the subject in 1868. He regards them as a partly submerged mountain chain, a continuation north-westward of that of Vancouver's Island and of the Olympian Mountains in Washington Territory. An island 156 miles long and 56 wide, enjoying a temperate climate and covered with forests of timber of some value (chiefly *Abies Menziesii*), is not likely to be left to nature much longer. But the customs of the natives in regard to the inheritance and transfer of land are unfavourable to settlement, and will demand just and wise consideration when the hour comes. It is as much private property as any estate in Wales.

Mr. Dawson's report contains a vocabulary of the language, which presents this peculiarity, that the words expressing family relationship vary with the speaker. Thus "father" said by a son is *haung;* said by a daughter, is *hah-ta.* "Son" said by a father, is *keet;* said by a mother, is *kin.* Evidently at some period the mothers were captives of a different tribe. It would be difficult to produce on the globe a more conspicuous example of the beneficent effect of missionary influence, mankind in a high degree susceptible to them, and alleviating what appears to us to be the misery of their lot.

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* The words, read by Archdeacon Hunter, are "oomah maskemow pache oonahne aetahmoo," and their purport is a direction, "This road come, oonahne flee thou." He cannot make out *oonahne.*

There are few subjects of greater physical interest, or which have received less investigation, than the extent to which the soil of our planet is now permanently frozen round the North Pole. Erman, on theoretical grounds, affirms that the ground at Yakutsk is frozen to a depth of 630 feet. At 50 feet below the surface it had a temperature of 28°·5 F. (– 6° R.), and was barely up to the freezing point at 382 feet. It is very different on the American continent. The rare opportunity was afforded me by a landslip on a large scale, in May 1844, of observing its entire thickness, near Fort Norman, on Mackenzie River, about 200 miles further north than Yakutsk, and it was only 45 feet. At York Factory and Hudson's Bay it is said to be about 23 feet. The recent extension of settlement in Manitoba has led to wells being sunk in many directions, establishing the fact that the permanently frozen stratum does not extend so far as that region, notwithstanding an opinion to the contrary of the late Sir George Simpson. Probably it does not cross Churchill River, for I was assured that there is none at Lake à la Crosse. It depends in some measure on exposure. In the neighbourhood of high river banks, radiating their heat in two directions, and in situations not reached by the sun, the frost runs much deeper than in the open. The question, however, to which Sir John Richardson called attention so long ago as 1839, is well deserving of systematic inquiry, and may even throw some light on the profoundly interesting subject of a geographical change in the position of the earth's axis of rotation.

The Saskatchawan was first navigated by steam in 1875, when a vessel of about 200 tons ascended from the Grand Rapid to Edmonton, 700 miles. There is, however, an obstacle at Cole's Falls, below Carlton House, which has led to a break of navigation, and a small steel steamer, originally intended for the Upper Athabasca, has recently been transferred to the Upper Saskatchawan; between the two, it is now navigated from the Grand Rapids, near Lake Winnipeg, to the base of the Rocky Mountains. A steamer also plies regularly on Lake Winnipeg, and has ascertained many interesting particulars of which we have hitherto been ignorant. Its greatest depth does apparently not exceed 100 feet. Its discharge has at last been followed by Dr. Robert Bell, down the Nelson River, to the sea. That gentleman reports the impediments to navigation to be insuperable, and a company has been very recently formed to make a railway from the lowest navigable point to the mouth of the Churchill River.

Our hopes of further light upon the history of the ill-fated Franklin Expedition, based on information given by a Netchelli Esquimaux to the American Captain Potter, in 1872, have been again disappointed. An American search expedition landed at Depôt Island (lat. 64°), in the neighbourhood of which traces were reported, in August 1878, wintered there, and examined the country, as yet with no result, except a correction of the charts.

Hudson's Bay itself cannot fail at no distant day to challenge more attention. Dr. Bell reports that the land is rising at the rate of 5 to 10 feet in a century, that is, possibly, an inch a year. Not, however, on this account will the hydrographer notice it; but because the natural seaports of that vast interior now thrown open to settlement, Keewatin, Manitoba, and other provinces unborn, must be sought there. York Factory, which is nearer Liverpool than New York, has been happily called by Professor H. Y. Hind, the Archangel of the West. The mouth of the Churchill, however, although somewhat further north, offers far superior natural advantages, and may more fitly challenge the title. It will undoubtedly be the future shipping port for the agricultural products of the vast north-west territory, and the route by which emigrants will enter the country.

Before leaving this quarter I must allude to the praiseworthy efforts of some of the Western States, especially Nebraska and Minnesota, to encourage the planting on the great plains by premiums, in which they have been followed by our own Province of Manitoba. Many years must elapse before the full climatic effects can be realised, but in time they cannot be doubtful, and with the impending disappearance of the buffalo, will disappear much of that arid treeless region, embracing nearly 600,000 square miles, which he now wanders over, and assists to keep bare by so doing. On the other hand, the short-sighted and destructive habit of burning off the prairie grasses to promote a young growth, increases with settlement, and is chargeable with incredible mischief. These fires have the curious effect, when they extend into wooded regions, of helping to exterminate the more slowly-growing and valuable descriptions of timber, and favouring the prevalence of the more worthless quick-growing kinds. But the Indians are even more chargeable with them than the whites, and the traveller encounters few more melancholy sights than a forest of charred and lifeless trunks extending over an area as large as a county, the fruit, perhaps, of a signal from one band to another.

A discourse on American geography would be incomplete without reference to that great design of piercing the Isthmus of Panama, with which Count Ferdinand de Lesseps has connected his name. Out of the conflict of about ten competing lines, the oldest and the youngest alone survive. The route by Lake Nicaragua appeared possible even to Cortez. It was accurately surveyed nearly seventeen years ago, and the estimates, although they have grown alarmingly, are still within practicable limits. It has the preference of the highest authorities in the United States. Its total length would be 180 miles, including 56 miles of lake navigation, with a summit level, to be obtained by lockage, of 107·6 feet.

The Panama route would shorten the canal to one-fourth of this length, and it is a cardinal point with its author to dispense altogether with locks. As we expect to be favoured by the presence of Lieut. Bonaparte Wyse—M. de Lesseps' coadjutor—I need say no more, except that the enthusiastic reception given to M. de Lesseps here in Swansea, not many weeks ago, is sure evidence that this great industrial centre takes a keen interest in his project from a commercial point of view; and we may safely leave capitalists, engineers, and diplomatists to fight out their battle, only concerned that by one route, if not by both, the world may reap in our day the vast benefit it already owes, in another quarter, to his genius and indomitable perseverance.

One of the most interesting questions in the whole range of geography still awaits positive proof or disproof in this region. I refer to the often asserted existence of a native race in Central America which holds no communication with Europeans, and preserves its ancient language, religion, and civilisation unchanged from the time of the Spanish Conquest. Antecedently so improbable as to be well-nigh incredible, it found credit with Mr. Stephens and Mr. Catherwood and Mr. Norman. A later traveller, Captain Carmichael, expressed, at this Association in 1870, his firm belief in it; and I will, with your permission, read an extract from a letter dated January last, which I received from that enthusiastic explorer, Dr. Le Plongeon, who has been for several years engaged in investigating the ruins of Central America.

"I have been told that there are many tribes in the interior of the country that have had but little contact with the Spaniards, and therefore have retained the purity of their language. This causes me to tell you here that the report—which many think hypothetical, of a vast extent of country, some assert 500 miles, comprised between Tabasco, Guatemala, Peten, and Yucatan, very mountainous, well-nigh inaccessible, that is inhabited by the remnants of various warlike tribes, the Chinamaces, the Laucaerones, the Itzaks, and others, who, flying before the Spaniards, have fortified themselves in very rich valleys, where they live to the present day as their fathers, at the time of the arrival of the Spaniards, and speak the pure unadulterated Maya—is not far from being true. I have inquired from parties who have lived in the neighbourhood of the Tierra de la Guerra, as they call it, and learn that people coming from the unknown regions are sometimes seen in the villages of the neighbourhood, where they barter tobacco, cocoa, and other products of their industry, for whatever they want; that of late some came to hire on the farm as labourers, but will not allow any white to penetrate their stronghold."

Tierra de la Guerra is an old designation for the region in which the boundaries of Honduras, Yucatan, and Guatemala meet, and which contains some twenty-five or thirty thousand square miles, an area quite extensive enough for small aboriginal communities to be hidden away in it; and if, as Dr. Le Plongeon thinks, the long-sought key to the Mexican hieroglyphics should be preserved among them, there is a brilliant reward for the first scientific traveller who, without shedding blood, can penetrate into their fastnesses. We shall, I trust, hear more of this region from a gallant and enterprising traveller, the Colonial Secretary of British Honduras, who has already penetrated its outskirts, and wants nothing more than a little aid and encouragement to advance beyond them. In a recent letter to me, Mr. Fowler says:—

"On the east coast of Yucatan, not far from the sea-coast, are the ruins of three cities, and close to our own frontier is a ruin which, the Indians tell me, contains plenty of mural paintings on the inside walls of the chambers. All these ruins are under the control of the Santa Cruz Indians. The chiefs of these Indians lately visited Belize and were shown much attention. I had them particularly in my charge. They received a Martini-Henry rifle each, and we swore mutual confidence in each other. They invited me to their country, promising me a safe conduct, and gave me leave to visit any ruin and take away what I liked."

That such an opportunity should be lost for want of a very moderate sum to defray the expenses of an expedition would be a matter of regret, which all present will share, and I am not without hopes that ways and means may be raised, through the co-operation of those who are interested in the subject from an historical, as well as a geographical point of view, to enable Mr. Fowler to carry out his project.

Mr. Edward Whymper, whose recent mountain-ascents in Ecuador have roused the interest of geographers and Alpine climbers in so high a degree, and whose presence to-day we had some reason to expect, is detained at Guayaquil. Fortune has favoured him to the last. He made a second ascent of Chimborazo in July, and after passing the night at an elevation of 15,000 feet, reached the summit in time to witness a magnificent outburst of Cotopaxi, 60 miles distant. The hot ashes were wafted to Chimborazo in such quantities as to cover the snow around him, and to produce an effect which he compares to the appearance of a newly-ploughed field.

It appears probable that we shall owe to America the solution of a question which, even within the limited area of these islands, often occupies our courts of law, and troubles us in daily life. I mean a definition of civil time. We have an extreme difference of time between Yarmouth and Valentia of about 48¼ minutes; but the merchant at San Francisco finds himself 3¼ hours behind his correspondent in New York, and the consequence has been an irregular acknowledgment of no less than seventy-five local standards of time on different railways in the United States. These it is now proposed to reduce to five, of exactly one hour interval, which would equally suit the Dominion of Canada. Mr. Sanford Fleming, late Engineer-in-Chief of the Canada Pacific Railroad, advocates the still bolder measure of adopting the meridian of 180° as a meridian for railway and telegraph time all over the world. It is not unworthy of this Section to aid in preparing the public mind for the legal adoption of prime meridians in this country at about ten-minute intervals. Thus Greenwich time might rule from Yarmouth to Winchester; Bath time from Winchester to Exeter, and so on; the first step towards which will be substituting meridians at 1¼° interval, corresponding to five minutes of time, for the unmeaning lines at 1° or 5° of angle, which are drawn on school maps at present.

I shall, perhaps, be accused of poaching on the manor of a brother President, if I venture to allude to another subject which belongs rather to the Geological Section. But a railway guide is surely a geographical manual, and in the American Geological Railway Guide of Mr. Macfarlane, we have a model and example of what may be done to disseminate knowledge, which I think worthy of passing notice. This portable and admirably-printed work tells the traveller, and the resident no less, the chief geological characteristics of the neighbourhood of every railway station in the United States. Is it extravagant to suppose that the same information, with the addition of the name of the county, the height above the sea, the prevailing industry, the population, the rainfall, the climate, and other constants, may be some day furnished by our great companies to the intelligent strangers who spend so many weary minutes in waiting at every station?

Turning now from a quarter on which I fear I have nearly exhausted your patience—from the West to the East. It is now nearly forty years since the corps of Royal Engineers was first associated with the exploration of Palestine by the employment of Captain Symonds, R.E., to determine the depression of the Dead Sea. The recent completion of the great map of that country is a performance whose unrivalled Biblical and topographical importance should not blind us to its geographical interest. The first surveyed of all known lands, it is also the last.

"Siloa's brook that flowed
Fast by the oracles of God"

is traced again, and the surprising local accuracy of the sacred writers established upon testimony beyond dispute.

The British survey, as you are aware, has been limited to the country west of the Jordan, an American Association having charged itself with the survey east of that stream. This is not yet published; but I trust that we shall have from Mr. Lawrence Oliphant an account of a part of that little-known region, from which he has lately returned.

Operations of war have been in all ages fruitful of geographical knowledge; many an old soldier of Alexander, we may be sure, was cross-examined by Eratosthenes; many a centurion of Hadrian related his weary marches in Gaul or Britain to Ptolemy, before those ancient geographers acquired the imperfect knowledge which served the world for so many centuries. The first legion that crossed the Alps accomplished a feat as arduous as the passage of Shutargardan or the Balkans, but it left us no record. To our own and the Russian Topographical Staff in Central Asia we owe, on the contrary, a series of explorations conducted under every difficulty, which must vastly facilitate the access of commerce to those distracted regions. Referring here to the former alone, they may be divided into three groups:—

1. Southern Afghanistan, embracing Quetta and Candahar.
2. The Kurram Valley, and generally the south of the Safaid Koh Range.
3. The north of the Safaid Koh Range, including the valley of the Kabul River and that city itself.

In the first of these an entirely new route through the villages of Tal and Chotiali, crossing several mountain passes, was followed by Major-General Sir M. Biddulph's column, and surveyed by Captain T. H. Holdich. Much new country was also surveyed by Lieutenant-Colonel W. M. Campbell between Pishin and the Afghan Desert. This officer thrice crossed the table-land of Toba, and by means of the field electric telegraph, has determined the difference of longitude between Quetta and Candahar.

On the south of the Safaid Koh Range we have at least 3000 square miles surveyed by Major R. G. Woodthorpe, embracing the Shutargardan Pass and the range which divides the Kurram from the Khost Valley. This officer, accompanied by Captain Martin, ascended in 1878 the highest peak on the Safaid Koh Range (Sikaram, 15,622 feet), but unfortunately was disappointed of observations by the hot-weather haze, which enveloped the peaks of the Hindu Kush. Mr. G. B. Scott, a civilian surveyor, was more successful, and obtained observations to all of them.

On the north of the Safaid Koh Range over 2200 square miles of new country were surveyed in 1878–9. The Shinwaries and Khagianis have, however, an insuperable aversion to plane tables and theodolites, and it was in no spirit of kindness that they gained for the gallant Captain E. P. Leach, R.E., his Victoria Cross. Less has been learnt about their country than could be wished. I am not overstating the services of our topographical staff in Afghanistan in estimating the aggregate of ground covered by their surveys or sketches at 140,000 square miles, and we have, through Major Tanner, got a little information respecting the almost unknown land of Kafiristan, lying to the north of Jalalabad. Disguised as a Kabuli, this gallant officer entrusted himself to a friendly Chugani chief, and penetrated some distance into that rugged country. He says of the principal village that the houses are piled one above another, and every beam, doorway, and shutter carved in a most elaborate manner. The designs, he adds, are crude, but such a mass of carving he had never seen before. The taste reminds us curiously of that of the mountaineers of Switzerland and the Tyrol. I regret that the limits of an address do not permit justice to be done to the services of these gallant officers.

In Zululand about 9000 square miles of country have been triangulated, and the details filled in, to some extent, at our Intelligence Department, from the numerous sketches of the staff; no such systematic survey was, however, attempted in this quarter as in Asia—a fact to be regretted, when we remember the excellent opportunity which the military occupation of a country affords for combined explorations.

In Central Africa we have the information given to Commander Cameron by his native guides, in 1874, that a river they called the Lukuga, which he descended four or five miles, is the outlet of Lake Tanganyika, confirmed and placed beyond dispute by Mr. E. C. Hore, of the London Missionary Society, who entered it in April 1879, found it free from the obstructions which arrested Cameron, and was able to go further down. Since which time, and quite recently, its course has been followed by Mr. Joseph Thomson almost to its junction with the Lualaba. The discovery is of extreme interest from every point of view, especially as pointing to the probable line of future communication of the regions bordering that great inland sea with the Atlantic, although the river itself, at least after the rainy season, is reported to be utterly impassable for canoe or boat of any description. The traveller himself, as you are aware, embarked for England on July 28, and doubtless will, if he shall arrive in time, afford us an opportunity of congratulating him on the safe accomplishment of one of the most brilliant and successful African expeditions on record. The most youthful of African travellers, for he is only twenty-two years of age, Mr. Thomson has carried out every point in the programme laid down for his late lamented chief, Mr. Keith Johnston, has done it admirably, and done it at a very moderate cost. I hold in my hand, by favour of the Royal Geographical Society, and the kindness of my friend Mr. Bates, copies of letters received within these few days (the last is dated Zanzibar, 19th July), giving an account of his adventures, which are many, since January last. They will appear in full in the next number of their 'Proceedings'; but I am sure I may anticipate their publication by reading a few extracts presently. They are rendered more than usually interesting by the melancholy fate which has since befallen Captain Carter whose genial welcome at Karema he records.

Time does not permit me to follow all the phases of that new-born activity which is establishing centres of exploration and of civilisation at every great lake in Africa. The Belgian Expedition, conducted by Mr. Stanley, and the Baptist Missionary Expedition, from San Salvador or Congo, are still aiming at the same point, viz. to reach Stanley Pool, above the falls, on the River Congo, the first by ascending the river, the latter by overland route, by way of Makuta or Zombo. The latter have met with great opposition at Makuta, and by the last account had not got within 100 miles of the Pool. That munificent benefactor of African missions, Mr. Robert Arthington, of Leeds, has paid a sum of 4000*l*. to the Baptist Society with a view to placing a small steamer on the river as soon as practicable, of establishing stations on the Ikelemba and M'bura rivers, and of opening communication by the latter with Lake Albert Nyanza. Much of this country is entirely unexplored.

The road in course of construction from Dar-es-Salaam on the east coast to Lake Nyassa, about 350 miles, has been completed through the coast jungle. Mr. Beardall, the chief engineer, has located the first section of about 100 miles to the valley of the Rufigi, and proposes to make use of the tributary river Uranga as far as navigable, up stream, towards the mountains which border the lake, before resuming his road-making. The highways of Central Africa, whether by land or water, exist as yet only in the hopes of philanthropists and the dreams of commerce, and I fear we must include among the visions that artificial sea which some geographers have proposed to make by conducting the waters of the Atlantic or the Mediterranean into depressions known to exist in the great Sahara. The subject has been examined by Herr v. Hesse-Wartegg, a German traveller, who will, I have reason to hope, favour us with a communication on the subject. Meanwhile, it appears to be tolerably well established that wells can be sunk almost anywhere, each becoming a centre of vegetation and productiveness.

I feel, ladies and gentlemen, that I have detained you from the business of the Section an inordinate time. But then I may remind you that when the British Association last met at Swansea, this Section (which was then combined with that of Geology) escaped an address altogether. A generation has passed away since; of the eminent men then present in office not half a dozen now remain, and in the retrospect it is so natural to take, the growth of geographical information stands out in remarkable prominence. Still—

"The cosmographer doth the world survey,"

and finds an illimitable field for the improvement of old, or the acquirement of new knowledge. Better methods of instruction, better books, and, above all, better maps, are changing the aspect of the study to the young; every traveller who settles one question raises others for his successors, so that "no man can find out the work that God maketh from the beginning to the end." Its perpetual youth is the charm of our science; may it also be my excuse.

PROCEEDINGS OF FOREIGN SOCIETIES.

Geographical Society of Paris.—July 16th: M. Grandidier in the Chair.—The President informed the Meeting that the Chamber of Deputies had just voted 100,000 francs towards the expenses of the Expedition of M. Savorgnan de Brazza and Dr. Ballay, who propose to ascend the Ogowé, and thence the large affluents of the Congo. The President said he was sure the Society would authorise him to express their thanks to the Deputy, M. Georges Perrin, to whom mainly the grant was due, the Commission having recommended the vote of 50,000 francs only. It was decided that an official letter of thanks be addressed to M. Perrin, who had given so many proofs of his devotion to the cause of geography.—The General Secretary read a letter from M. Ch. Wiener, French Consul at Guayaquil, in which it was stated that by a strange error this seaport was placed S.S.W. instead of south-west of Quito. M. Wiener explained the mistake as originating in the old maps. The inhabitants of Quito maintain that the road from Quito to Guayaquil is still the most convenient route to the sea-coast. Wishing to test this assertion, M. Wiener had undertaken the measurement of a new and more direct route in April last, in company with Baron Gunzburg. From Quito there is a route viâ Lloa where the high plateau of Lloa is reached, furrowed with deep *quebradas* or gorges. The slope from the right bank of the River San Lorenzo is very steep, and there is therefore no practicable line of direct route from Quito to the place called Mirador. M. Wiener found, however, that by a detour the main road to Tambillo might be reached. He passed this by turning to the west and crossing the high plateau of the Cordillera, north of Mount Corazon. The descent may be effected in three hours by an existing path which leads to Maquina. From that place he followed, by a slightly undulated track, the banks of the San Lorenzo (called lower down the Pilaton) as far as Toachi, crossing a hill which is met with on the road. The ground thenceforward is level to Mirador, and from that point the road to the Pacific can be reached without any difficulty, by following the watershed between Esmeraldas and Guayaquil. M. Wiener believes that a good road may be easily made along the line he has traced.—M. Wiener also communicated details regarding the ascents of the high peaks of Ecuador made by Mr. Edward Whymper. With his companions the brothers Carrel, Swiss guides, he had walked from Bodegas to Quito, carrying mercurial barometers and aneroids for the measurement of the mountains. He had ascended Chimborazo (20,600 feet), Cotopaxi (19,500 feet), Antisana (18,750 feet), Cayambé (19,250 feet,) Saryurcu (15,400 feet), and Catocachi. He was, at the time of writing, about to leave Quito again for the purpose of ascending Iliniza, Altar, and Carihuairazo, hoping also to make a second ascent of Chimborazo.—M. Soleillet informed the Meeting that he had just received from Senegal the discouraging news that the expedition commanded by Captain Gallieni had been plundered, and forced to return to St. Louis.—M. de Quatrefages read a letter from the Secretary of the Belgian African Association stating that the construction of station Karema, on the eastern shore of Lake Tanganyika, was reported as completed on the 9th May, and that M. Popelin was about to cross the lake and establish a post on the western side, afterwards continuing his journey to Nyangwé. It was further stated that Mr. Carter was preparing to leave Karema for Zanzibar, with the object of preparing measures for training African elephants, and that the reinforcements on the march for Karema, under MM. Cadenhead, Burdo, and Roger, were making good progress, and had found the donkeys presented by Messrs. Mackinnon and Sanford of great service.—A paper was then read by M. de Lamothe on secular changes of level in the bed of the Nile. M. de Lamothe in the course of his investigations had found numerous traces of old channels of the river, which proved that the irrigated and productive area was much more extensive in ancient times than in the present day, and he maintained that by means of dams, constructed at a comparatively cheap rate, it would be possible to force the Nile to spread over a great extent of country, thus rendering it more healthy and available for settlement and cultivation.—In the discussion which followed on this subject, Dr. Harmand said that from his experience as a medical man in hot countries, he could not allow the statements and theories of M. de Lamothe to pass without protest. Especially he would take objection to his assertion that hot countries were more insalubrious to Europeans in proportion to their dryness. The contrary was indubitably the case. All medical men and all travellers who had sojourned in tropical regions would bear witness to the fact that the most unhealthy districts were the most humid—it was thus in the Gaboon, Bengal, Cochin China, Guiana, and so forth; the rainy season, too, in these countries was in like manner the most prejudicial to health. Dr. Ballay and M. Soleillet also spoke to the same effect.

—— August 6th: M. GRANDIDIER in the Chair.—The President announced to the Meeting the presence of MM. Brito Capello and Robert Ivens, officers of the Portuguese Navy, who had undertaken, with Major Serpa Pinto, the journey of exploration in the interior of Western Africa, some of the results of which had already been made known to the world. Their companion, Serpa Pinto, having left them at Bihé to make his bold journey across the continent, the other two officers had turned to the north and explored and mapped a vast extent of new country. "We are happy," he said, "to welcome in them representatives of the revived spirit of geographical enterprise in Portugal, which we have already had occasion to applaud in this hall; and you will now have the pleasure of hearing from the lips of these, our guests of the evening, an account of their successful explorations."—Dr. Harmand then read a paper entitled "Critical Remarks on certain Ethnological Theories in a Paper on Tong-king, by M. Romanet du Caillaud, in the last Bulletin of the Society." Dr. Harmand combated the opinions of this author with respect to the Annamese belonging to the same race as the Muong savages of the Ninh-binh and Than-hoa, whom he believed to differ only by their admixture of Chinese blood. Dr. Harmand considered it impossible to admit the smallest affinity between the savages and the Annamese, who belong to two radically distinct races. With respect, further, to the language of the Muongs, he believed the statement of M. du Caillaud, that it was only a dialect of the Annamese tongue, to be quite destitute of foundation. Whilst making these objections, Dr. Harmand readily acknowledged the merit of M. Romanet du Caillaud's work and the care with which he had studied the history of modern insurrections in Tong-king.—A letter was read from Père Duparquet giving an account of his journey from Walvisch Bay to Omaruru, and from Omaruru to the Ovampo. The country between the two latter is not an uninhabited region, as represented by previous travellers, but contains a numerous population. In fact, the interior is covered with forests and tracts of pasture-land, whilst the maritime districts are arid and sandy. The tribes are pastoral and are scattered over the country during the rainy season, but concentrated in the dry season in the neighbourhood of springs and permanent water-holes. From the Ovampo Père Duparquet crossed the Kaoko Range on the southern side of the Cunene. On the beautiful wooded plateaus of these mountains he met with a party of emigrant Boers from the Transvaal. He reached the Ovampo and remained some time with the chief of the country, and met with English and Portuguese traders. The valley of the Ovampo he describes as exceedingly fertile—a veritable garden, watered by numerous rivers rich in fish. Père Duparquet is the first Frenchman to have visited this region, but he is about to be joined by M. Dufour, a member of the French Geographical Society.—Lieutenant Ivens then addressed the Meeting on the subject f the explorations made by the Portuguese African Expedition. He dwelt particu-arly on the products and inhabitants of the regions traversed, and gave some account f his meteorological and magnetic observations. From Bìhé the Expedition descended he Cuango as far as the 6th parallel of south latitude, finding a gradual deteriora-ion in the physical and mental qualities and social condition of the native tribes as hey quitted the highlands and descended the river. The sources of the Cubango and uango were determined, besides those of a large number of the affluents of the latter iver, and a vast lacustrine region discovered in latitude 6° 30′ S.—A paper was then ead by Dr. Bayol on his recent journey from the Senegal to the Niger and back, in onnection with the expedition of Captain Gallieni.—The General Secretary announced the Meeting the departure of Dr. Jules Crevaux to South America, with the object f continuing his explorations of the tributaries of the Amazons. His intention is penetrate to the Upper Rio Negro from Santa Fé de Bogotá, and to descend that ver. He is accompanied by M. Lejane and his faithful Guiana negro, Apatou.

With this meeting concludes the Session of the Society for 1879–80.

NEW BOOKS.

(By E. C. Rye, *Librarian* R.G.S.)

EUROPE.

addeley, M. J. B.—The Thorough Guide to the English Lake District. London (Dulau): 1880, 12mo., pp. 214, maps. Price 5s.

This Guide, more after the scheme of Bædeker's well-known Continental Series than any of its native predecessors, gives a very complete account of the numerous conspicuous features of the physical geography of the Lake District, and is well illustrated by a general map (scale 3 miles to the inch) and 12 sectional maps (scale 1 mile to the inch). These are from the Ordnance Survey, and show altitudes of 500 feet interval by coloured contour lines. Full details of towns and other information useful to travellers are given alphabetically.

urope and her Colonies.—Registrande der geographisch-statistischen Abtheilung des Grossen Generalstabes. Neues aus der Geographie, Kartographie und Statistik Europa's und seiner Kolonien. X. Jahrgang. Quellennachweise, Auszüge und Besprechungen zur laufenden Orientirung bearbeitet vom Grossen Generalstabe, geographisch-statistische Abtheilung. Berlin (Mittler): 1880, 8vo., pp. 596, map.

This invaluable combination of Index, Record, and Analysis, published annually by the Geographical and Statistical Department of the Prussian General Staff, referring to all books, treatises, papers, and maps, official or otherwise, and in all languages, bearing upon the countries of Europe and their possessions in any part of the world, has now increased to the bulk of some 600 pages from the 164 of its first issue in 1869 (for 1867–68), and is probably entirely unknown to the great majority of our readers as a most trustworthy and exhaustive source of information.

The present issue contains the literature of 1879, and is accompanied by a key-map showing the condition of topographical map-work in Central Europe in that year (scale 1 : 2,750,000), on which the scales of the then existing topographical maps of each country, and the areas covered by them, are given, with explanatory notes. Originally designed for military purposes, the greatest detail is naturally given with regard to the armies of the different countries and their equipments; but all sources of information upon the trades, industries, statistics, products, means of communication, physical and political geography, geology, &c., of the various countries are also noticed (the larger regions being subdivided into departments, provinces, or counties, to facilitate reference); and the volume commences with general works on geography and the other subjects subsequently discussed in local detail.

Vogel, Charles.—L'Europe Orientale depuis le traité de Berlin. 1re Livraison. Paris (Reinwald): 1880, 8vo., pp. 80. (*Dulau:* price 1s.)

The present political complications in Eastern Europe have caused the author to issue a separate part of his 'Monde terrestre' (*anteà*, p. 523), comprising Russia, Turkey, Greece, Montenegro, &c. This is to be completed in about 7 livraisons, the last of which will contain a map with the new boundaries.

ASIA.

Dalboquerque, Afonso.—The Commentaries of the great Afonso Dalboquerque, Second Viceroy of India. Translated from the Portuguese edition of 1774, with notes and an Introduction, by Walter De Gray Birch, F.R.S.L. Vol. III. London: printed for the Hakluyt Society (Richards, 37 Great Queen Street, W.C.): 1880, 8vo., pp. lvi. and 308, map, pls.

Forms No. LXII. of the Hakluyt Society's publications, the two preceding volumes forming Nos. LIII. and LV., and bearing date respectively 1875 and 1877. The period covered by it is from the assault of Goa in November 1510 to the arrival of Garcia de Noronha at Goa in February 1513. The plates are reproductions of Pedro Barretto de Resende's portraits of Vasco da Gama and of Diogo Lopes de Siqueyra, and plan of the fortifications of Malacca (all three from the Sloane MS., Brit. Mus.), and a bird's-eye view of Malacca, from Correa's 'Lendas da India.' The map is of the Malay Peninsula and adjacent parts, from the Portolano of Diego Homem, 1558. In an appendix, descriptions are given from the 'Livro do Estado da India Oriental' by De Resende (Sloane MS.) of Malacca and Goa with its dependencies.

Midden-Sumatra. Reizen en Onderzoekingen der Sumatra-Expeditie, uitgerust door het Aardrijkskundig Genootschap, 1877–1879, beschreven door de Leden der Expeditie, onder Toezicht van Prof. P. J. Veth. Leiden (Brill): 1880, sm. 4to., Atlas fo.

The general particulars and geographical results of the recent Dutch Expedition to Central Sumatra under the late Lieutenant Schouw Santvoort, in which Mr. A. L. van Hasselt and Mr. D. D. Veth took a conspicuous share, have already been given by our Honorary Corresponding Member, Professor P. J. Veth, the President of the Dutch Geographical Society, in our 'Proceedings' for 1879, p. 759 *et seq.*

The publication in full of the whole account, with its scientific results, is now commenced, under the auspices of the Dutch Geographical Society, and will evidently, when completed, leave nothing to be desired, except an English translation. The whole work is intended to occupy 386 pages, with 52 plates and maps; and we have received from the Society, through Professor Veth, the following parts:—

1. 1ste Aflevering. Reisverhaal, Eerste Gedeelte, door A. L. van Hasselt en Joh. F. Snelleman, pp. 1–128, Frontispiece, and pls. ii., v., vii., viii., x., xiii.

This portion, descriptive of the journey, commences with an account (by Colonel Versteeg) of the origin and status of the Expedition, followed by a sketch of the political condition of Central Sumatra (by Professor Veth). The narrative reaches to the date of May 15, 1877, at Grabak, on the journey over the west coast mountains towards Silago, a town on the east bank of a like-named tributary of the Mamoen, itself a southern affluent of the Batang Hari.

The plates mentioned, from photographs by Mr. D. D. Veth and Mr. van Hasselt's sketches, are remarkably characteristic, and contain views of the Batang Hari, the Sikia Valley at Grabak, the Batang Poelau, Alahan pandjang, the Atas Lake, and Mount Korintji, with the last encampment during its ascent.

2. 1ste Aflevering. Aardrijkskundige Beschrijving, door D. D. Veth, pp. 1–56, Frontispiece.

Contains a description of the maps, an account of the mountain and river systems of Central Sumatra, and the commencement of the meteorological and climatological observations. The plate shows the Batang Hari at the Mamoen confluence.

3. 1ste Aflevering. Volksbeschrijving en Taal. Tweede Gedeelte, door A. L. van Hasselt, pp. 1–80, Frontispiece, pls. i.–xix., xxiii.–xxv.

This second section, on languages, is anticipatory of the ethnological first section, to which the plates refer. Some of the latter are coloured, and represent costumes, domestic implements, fine art manufactures, &c.; the others (lithographs) give types of the people, of different positions in life, sex, and age.

4. 1ste Aflevering. Natuurlijke Historie, door Joh. F. Snelleman, mit Medewerking van vele buiten- en binnenlandsche Geleerdeen. Frontispiece.

Contains the 2nd part, pp. 1–14, Reptilia and Pisces, by Dr. A. A. W. Hubrecht; the 3rd part, pp. 1–18, pls. i.–iii., Mollusca, by M. M. Schepman, with introduction by J. F. Snelleman; the 8th part, pp. 1–84, Lepidoptera, by P. C. T. Snellen, with introduction by Snelleman; and the 11th part (C), pp. 1–5, pls. i. and ii., Crustacea, by Dr. J. G. De Man. Three plates of the Botanical Section are also given.

The atlas, illustrating the 2nd part, contains 12 maps in photolithography; No. 1, of Central Sumatra (scale 1 : 500,000), showing the different routes of the members of the expedition, and including from the Singkarah Lake on the north to Mount Korintji on the south, and Padang on the west to the confluence of the Tebo with the Batang Hari on the east—with insets of Padang (scale 1 : 40,000), the summit of Korintji (scale 1 : 20,000, with contour lines of elevation), and a section of elevations; No. 2 (same scale), continuing the course of the Batang Hari to its mouth, and including the delta of the Reté on the north and about 12 geographical miles of the lower course of the Tembesi southern tributary; No. 3 (same scale), of Benkoelen, Lebong, and the upper waters of the Batang Rocpit and other western affluents of the Rawas, with insets of Lebong on a larger scale (1 : 20,000), and profile sections; and No. 4 (scale 1 : 500,000), continuing No. 3 eastward to Palembang (with inset of that town, scale 1 : 80,000), and including the course of the Moesi and its various tributaries. Nos. 9 and 10 are sheets 2 and 3 of the maps of the mouth of the Batang Hari (scale 1 : 60,000), with soundings and various insets; Nos. 11 to 15 (same scale), give the course of the same river from Moera Kompé to Semalidoe, with various insets (especially of the River Tongkal), on a larger scale; and No. 16, the Tembesi from its junction with the Batang Hari to Ladang pandjang, with soundings and tidal references.

Playfair, G. M. H.—The Cities and Towns of China. A Geographical Dictionary. Hongkong (Lane, Crawford & Co.): 1879, 8vo, pp. 1–12, 1–417, Appendices. (*Trübner:* price 1*l.* 1*s.*)

Practically a rearrangement of Biot's 'Dictionaire des Villes Chinoises,' with the addition of the more important smaller towns, various cities in Turkistan and elsewhere to the west, and some corrections. The list is necessarily incomplete, but is offered as a contribution towards a more thorough knowledge of the geography of China than is yet possessed by Europeans. No claims are made to scientific accuracy in the positions given, which are however considered to be sufficient to enable localities to be found readily on any foreign or native map of China. In the few instances where corrections have been made from our Admiralty charts or calculations at the Russian Observatory at Pekin, errors of considerable importance have been observed. Sir Thomas Wade's system of orthography is adopted for the Chinese names. The first Appendix (pp. 1–31), contains a synoptical table of the administrative cities of China arranged alphabetically under their provinces; the second (pp. i.–lviii.), is a Radical Index, with corrigenda.

AFRICA.

Kranz, M.—Natur- und Kulturleben der Zulus, nach vieljährigen Beobachtungen, statistischen und klimatischen Berichten geschildert. Wiesbaden (Niedner): 1880, 12mo., pp. 256. (*Williams & Norgate*: price 3*s.*)

The author, who has been in the English Colonial Medical Service both in Victoria and South Africa, gives an historical sketch of the Zulus as a nation, preceded by a short general South African chronology, and followed by an account of Zulu physical and moral culture, a geographical and geological outline of the country, and a special professional section. A few barometrical and thermometrical tables are given, and a very imperfect bibliography.

Tchihatchef, P. de.—Espagne, Algérie, et Tunisie. Lettres à Michel Chevalier. Paris (Baillière): 1880, large 8vo., pp. 595, map. (*Dulau*: price 9*s.*)

In the autumn of 1877, M. de Tchihatchef crossed from Spain to Oran and went by rail to Algiers. Thence, after various excursions among the mountains of the coast, he travelled by the Akbou road to Bougie, visiting Setif and Constantine, from which place he struck south to Batna, El Kantara, and Biskra, his furthest points being Zaatcha and Si Okba. Phillipeville, Bone, and Guelma were also visited, and some excursions made in the environs of Tunis. As in his former works the author, though travelling on comparatively beaten tracks, avoids trite subjects, and by his original accurate observations on points of scientific interest (especially in botany, but also in geology and archæology) throws a considerable amount of interest and new light on the countries traversed.

The author pleads his twenty years' experience of Oriental people as a justification for his opinion that the work accomplished by French colonists in Algeria is, contrary to the idea generally received, not only unsurpassed by similar attempts on the part of the most privileged nations, but very rarely equalled by any of them.

In the Appendices he gives some detailed botanical lists (the whole work, indeed, teems with notes on the distribution, &c., of plants) and meteorological observations, concluding with observations on Appian and the historians of Carthage bearing on the curious deficiency of accounts of Scipio's destruction of that city. The absence of any local information upon Carthage in particular or Africa in general in the writings of ancient African writers, both sacred and profane, is also noted.

AMERICA.

Cotteau, Edmond.—Promenades dans les deux Amériques, 1876–1877. Paris (Charpentier): 1880, 16mo., pp. 320, maps. (*Dulau*: price 3*s.*)

The narration of the personal experiences and impressions of a tourist across North and round South America.

Steele, Thomas Sedgwick.—Canoe and Camera: a Two hundred mile tour through the Maine Forests. New York (Orange Judd Co.): 1880, squ. 8vo., pp. 139, map, map in cover. (*Trübner*: price 7*s.* 6*d.*)

A sketch of a fishing excursion in the lacustrine region of N.E. Maine, well illustrated by a map (by W. R. Curtis, C.E.) of Moosehead Lake and the head waters of the Aroostook and Penobscot rivers (scale 5 miles to the inch). The author claims to have discovered a new lake, named Steele Lake on the map, between Matagamonsis and Matagamon, 15 miles east of the most easterly point of Chamberlain Lake. This, however, would seem to be only a temporary enlargement of the connecting east branch of the Penobscot, or rather of Hay Creek that flows into it between Matagamonsis and Matagamon, as the author refers to the exceptional volume of all the streams during his journey.

ARCTIC.

De Novo y Colson, Pedro.—Historia de las Exploraciones Articas hechas en busca del Paso del Nordeste. Madrid (Fortanet): 1880, 8vo., pp. 260, map, pl.

A chronological account of the attempts to make the North-east Passage, with a general map showing Nordenskiöld's route to Japan, and a portrait of that explorer. A short preface is given by C. F. Duro.

NEW MAPS.

(By J. Coles, *Map Curator* R.G.S.)

WORLD.

Hermann Berghaus. — Allgemeine Welt-Karte in Mercator's projection zur Uebersicht der Deutschen Consulate, deutscher Seeverkehrs-Linien und des Welt-Postvereins. Justus Perthes, Gotha, 1880. Price 4*s.* (*Dulau.*)

This map contains a large amount of information as to the existing means of communication between all the countries of the world, either by telegraph, post, or mail steamer; and though its size is small, being only 23 inches by 26, it is so clearly executed that there is no difficulty whatever in reading either the names or figures.

EUROPE.

Austrian Military Geographical Institute.—Umgebungs-Karte von Kaschau. Scale 1 : 75,000 or 1 geographical mile to an inch. Price 3*s.* coloured. (*Dulau.*)

—— Umgebungs-Karte von Przemyśl. Scale 1 : 75,000 or 1 geographical mile to an inch. Herausgegeben vom k. k. militär-geograf. Institute in Wien. Price 3*s.* coloured. (*Dulau.*)

Civiale, A.—Carte des Alpes, de la Savoie, du Dauphiné, de l'Italie, de la Suisse et du Tyrol executée d'après ses panoramas photographiques et les cartes d'États-Majors Français, Suisse, Italien et Autrichien. Scale 1 : 600,000 or 8·1 geographical miles to an inch. Paris. Price 18*s.* (*Dulau.*)

This map shows the routes taken by the author, and is accompanied with a pamphlet indicating the heights of the Alps, the best passes, and easiest places of ascent. Scales of English and Austrian measurements are also given.

Hilscher, A.—Wandkarte des Kreises Poln. Wartenberg. 6 sheets, chromolith. Price 9*s.* (*Dulau.*)

Petters, H.—Karte vom Kaisergebirge in Tirol. Herausgegeben vom deutschen u oesterreich. Alpenverein. Nomenclatur von Th. Trautwein. Scale 1 : 50,000 or 1·4 inch to a geographical mile. München. Price 1*s.* (*Dulau.*)

Petermann's 'Geographische Mittheilungen.'—Karte des Weser-Stromes von Bremen bis Bremerhaven. Nach den im Maassstabe von 1 : 4000 aufgenommenen und in den Jahren 1878 and 1879 vollendeten Specialkarten der Uferstaaten: Preussen, Oldenburg u. Bremen, reducirt von Ingenieur R. Zacherl. Scale 1 : 50,000 or 1·4 inch to a geographical mile. Petermann's 'Geographische Mittheilungen,' Jahrgang 1880, Tafel 14. Justus Perthes, Gotha. (*Dulau.*)

Ravenstein, Ludwig.—Karte der West-Tiroler und Engadiner Alpen, enthaltend die Gebirge des Oberinnthales bis zum Rheinthale, Berninagebirge, Süd-Vorarlberg, Arlbergbahn, Brennerbahn, Vintschgau, Innsbruck, Bozen, Meran, Bormio u. Chur, Oetzthaler-, Stubaier-, Sarnthaler- und Ortler-Alpen. (Karte der Ostalpen in 9 Blättern, Blatt IV.) Scale 1 : 250,000 or 3·4 geographical miles to an inch. Ludwig Ravenstein, Frankfurt am Main. Price 6*s.*

Reitzner, Hauptmann V. von.—General Karte von Griechland, Thessalien und dem Epirus, mit einem Suppl.-Blatte enthalt. Albanien, Rumelien und Macedonien. Scale 1 : 1,000,000 or 13·6 geographical miles to an inch. Chromolith. Vienna. Price 3*s.* 6*d.* (*Dulau.*)

Schulz, R. A.—Karte des Schneebergs und der Raxalpe, nebst der Schneealpe und Maria-Zell. Scale 1 : 72,000 or 1·02 inch to a geographical mile. Wien. Artaria & Co. 2 sheets. Price 3*s.* (*Dulau.*)

Skrzeszewski, A. v.—Karte der Umgebung von Bad-Gastein und Rundschau vom Gamskahr-Kogl. Scale 1 : 50,000 or 1·4 inch to a geographical mile; nebst Plan von Wildbad-Gastein. Scale 1 : 7200 or 10·1 inches to a geographical mile. Vienna. Price 2*s.* (*Dulau.*)

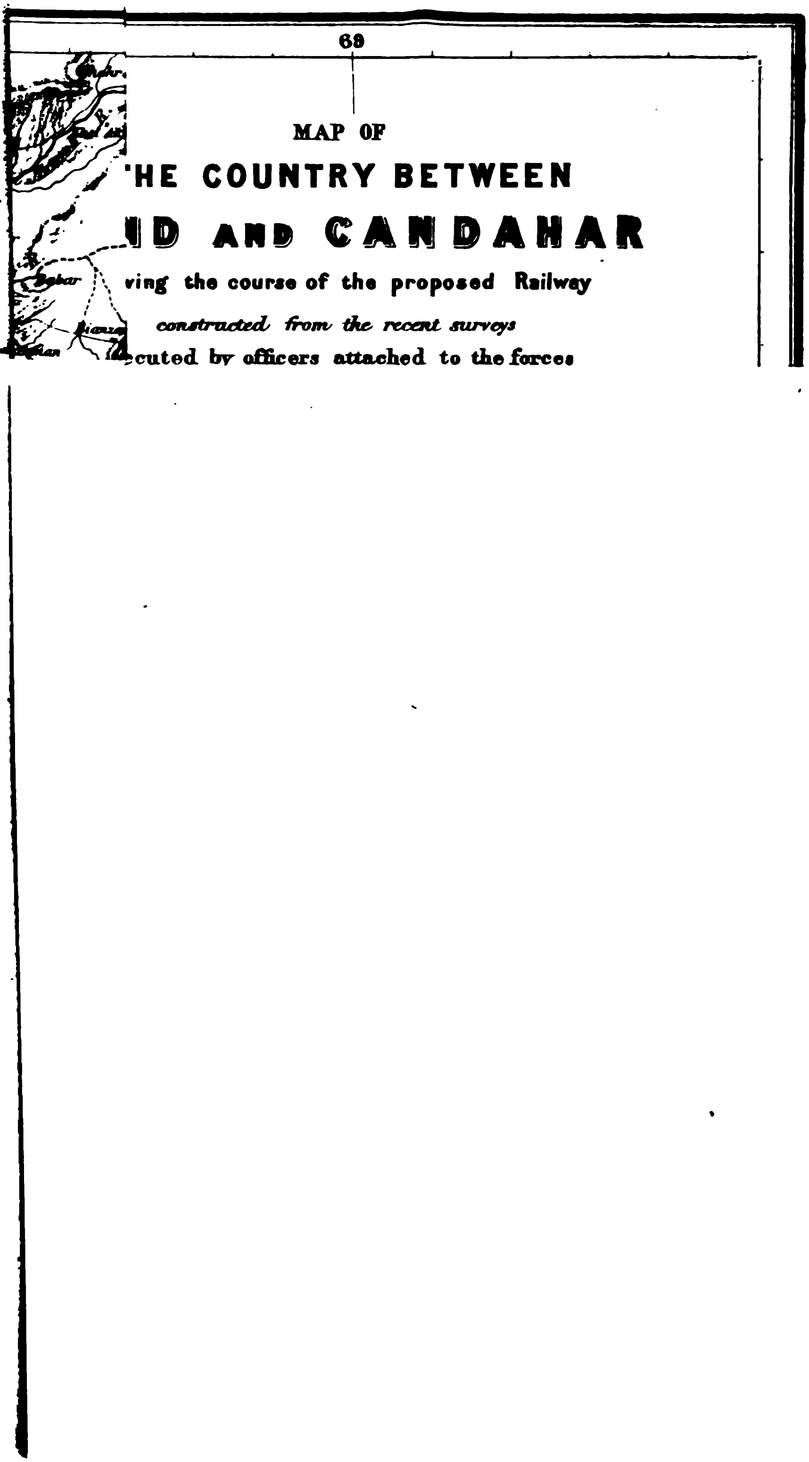
Talive, Sevin.—Atlas cantonal de Lot-et-Garonne dressé par Sevin-Talive. Scale 1 : 30,000 or 2·4 inches to a geographical mile. Cartes du Canton de Marmande, arrondissement de Marmande,—du Canton de Port-Sainte-Marie, arrondissement d'Agen,—et du Canton de Villeneuve, arrondissement de Villeneuve. Deuxièmes éditions corrigées par M. Leterrade, 1880. Price 2*s.* 6*d.* each. (*Dulau.*)

EDUCATIONAL.

Turnbull & Foster. — Turnbull and Foster's new astronomically mounted Terrestrial Globe.

Though this method of mounting globes has been in practice in Canada for two years, I am not aware that it has been adopted by any of the globe-makers of this country, and it may therefore be interesting to those engaged in educational pursuits to give an outline of the design of mounting which has been adopted by Messrs. Turnbull and Foster, who claim that there are at least eleven new mechanical arrangements in its construction.

The great circle which surrounds the globe represents the ecliptic, which is substituted for the old plan of the use of the wooden horizon. This great circle is divided into two parts, the outer one being fixed, and the inner circle, which is of brass and which is also a portion of the ecliptic plane, revolves round the globe and carries the sun's place with all the other mechanical appendages, one of which is a dark zone 18° broad fixed at right angles to the movable ecliptic; by means of this zone the times of the sun's rising and setting, and the length of twilight are found. There is the usual brass circle of terrestrial latitude permanently fixed from pole to pole, but this has also another important motion, as it is carried round with the sun it illustrates at sight the sun's motion in declination. The hour circle is placed on the South Polar axis, and as it is carried round by the solar meridian it is always with the sun's centre, by which means we have at once the longitude of any place, east or west on the globe, and the local time; this circle is fitted with a vernier for reading time or arc, which can be shifted to suit any meridian by a screw that fixes it to the axis. These are some of the principal features of this method of globe-mounting, and though some of these are not new, yet the design as a whole is, and seems to be well adapted to exhibit to pupils the real causes of all those changes of light and heat, which take place on different portions of the earth's surface. Any person wishing to inspect one of these globes can do so by calling at the Society's Map Room.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MAP OF
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bly a con-that part of Norway of which it is the continuation. The hills seldom attain an elevation of 1500 feet, and where they are exposed to the direct sea blast the bare rock is only relieved by birch scrub and various kinds of heather. Further inland the trees increase in size and number, until at a distance of 25 or 30 miles from the sea the birch is nearly lost in extensive forests of well-grown pine. The surface of the country is undulating, and the character of the landscape is quiet, lonely beauty. From the highest ridges, the eye ranges over an immense tract of thickly wooded hills, interspersed by numerous lakes, and varied by glimpses of river winding like silvery threads towards the sea. It is hardly possible to conceive a greater contrast to the ice-bound regions which lie between the same parallels of latitude in the western hemisphere. Patches of the light, graceful birch are interspersed among the dark, melancholy pines, having completely usurped the ground where the woods have been destroyed by fire. The aspen, mountain ash, willow, alder, bird-cherry, and wild currant, are also common, especially on the banks of the rivers and lakes. In Lapland the spruce appears to grow nearer the sea than the pine, the reverse being the case in Scandinavia. The woods recede abruptly from the coast to the eastward of Kola, where low-lying level tracts, which extend far inland, are fully exposed to the withering gales from the north-east. From Kandalaks eastward to Varsuga the spruce and pine descend to the sea-shore, but fall back gradually towards Sosnovets, where the birch barely reaches the Arctic circle. In spite of the prevalence of fires, the wasteful method of extracting resin, and the stripping of bark for bread,* before the forests were placed under proper supervision, there is still ample scope for judicious felling. Two of the largest rivers of Lapland, the Tulom and the Kola, both of which fall into the Kola Fiord, traverse the most thickly wooded districts, and would afford easy transport for timber; there are good sites for saw-mills at the mouth of the Kola, and a ready market would be found in Finmarken.† At present, however, timber is only exported from the White Sea and Archangel, on account of the restrictions imposed by the Russian Government.

Rivers.—With regard to the rivers and lakes in the interior of Russian Lapland, the maps hitherto published in England are both incomplete and incorrect. Many corrections have been made on the accompanying map, partly from the observations of Professor Friis—from whose works much of the information in this paper has been derived—partly from the maps of the Inspector of Forests of the district, and partly from information obtained from intelligent natives.

The river system of Russian Lapland may be considered in two divisions, the Murman Sea and White Sea rivers. The former flow in a northerly, the latter in a southerly direction, and half-way between them the Ponoi River flows from west to east.

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* See page 601.

† The northernmost "amt," or province, of Norway.

The principal Murman Sea rivers between the Pasvig[*]—which for the greater part of its length forms the boundary between Russia and Norway—and Kola Fiord are the Bætsamjok,[†] Bomenijok,[‡] Latshajok (in Russian, Kitzareka, or Fox river), Orajok, Tshadnajok, Tulomjok,[§] and Kolajok.[‖]

The unwooded country between Kola Fiord and Ponoi is intersected by several rivers, the largest of which are Tiriberka, Vuronje (in Lappish Kardok or Kardejok—"fence or boundary river"), and Jokonga (in Lappish Jokkojok).

The principal White Sea rivers are Tshjavanga, Varsuga or Varzouka,[¶] Umbra, and Niva,[**] which forms the outlet of Lake Imandra.

The largest river in North Karel is the Kovda, which falls into the Gulf of Kandalaks at the town of Kovda, and is there 630 feet broad. It is larger than the Tulom, and is equal in volume to the Glommen, the largest river in Scandinavia. Rising in the great lake Tuoppajärvi,[††] the Kovda first runs through Pääjärvi, then through five smaller lakes, and finally through Koutojärvi, from which it takes its name.[‡‡]

There are no high falls on any of the larger rivers of Russian Lapland. In the Tulom, salmon not only run up to Nuotjavre,[§§] but also through that lake and up the Lut River to the frontier of Finland. In the Kola, they run up to Guollejavre. Salmon are seldom found in the Niva, though, as far as falls are concerned, they might run up to Imandra. In the Kovda they run up to Pääjärvi.

Lakes.—The principal lakes of Russian Lapland are Imandra, Nuotjavre, Guollejavre, Umbozero, Koutojärvi, and Pääjärvi. The largest of all is Imandra, which is also called Inandra,[‖‖] or Lower Imandra, to distinguish it from Enare, which was formerly called Upper Imandra. The Lapps, however, call it Aver.[¶¶] It is about 60 geographical miles long, but less than nine in width at the broadest part. The greatest depth, according to the Lapps, is 150 feet, but Professor Friis could not find more than 66 feet. The isthmus between Guollejavre and Pieresjaur is a strip of low, swampy land, barely two-thirds of a mile broad, and as Guollejavre is the source of the Kola River, which falls into the Barents Sea, while Pieresjaur is connected with Lake Imandra and the Gulf of Kandalaks, the eastern part of the peninsula is very nearly insulated.

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[*] From the Lappish *basse*, "holy." The river is also called the *Kloster*, because the salmon fishery once belonged to the Peisen monastery.

[†] From the Lappish *bætsam*, "fir." *Jok*, pronounced *yok*, is the Lappish for "river." The Bætsam is called *Peisen* by the Norwegians, and *Petshenga* by the Russians.

[‡] Probably from the Lappish *bomen*, or the Norwegian *bumand*, "husbandman."

[§] From the Lappish *tulvom* or *dulvom*, "flood"; probably so called from its breadth, and the great extent of the spring and autumn floods; or possibly from the "flood-stream," the river being tidal up to the first rapid, a distance of 10 versts (6·6 English statute miles) from the sea.

[‖] See note † to page 593.

[¶] The "lodjes," or Russian coasters, ascend the Varsuga for a distance of several miles.

[**] *Niva* is a Finnish word signifying "rapid," or "torrent." The name is very appropriate.

[††] *Järvi*, pronounced *yærvi*, is the Finnish for "lake."

[‡‡] The Lappish word *goudo*, or *gooda*, signifies "broad."

[§§] *Javre* or *Jaur* is Lappish for "lake."

[‖‖] Perhaps from the Finnish *ina* or *enar*, which means "a little net." In Finnish, therefore, both Inandra and Enare would signify "Net-lake," a name probably suggested by the numerous islands.

[¶¶] Probably from the Finnish *avara*, "open" or "great" lake; or possibly a contraction of the Lappish *oaive-jaur*, "head" or "chief lake."

Next to Imandra the largest lake is Nuotjavre. It is said to be about 35 geographical miles long, and 7 broad. Like Imandra, it is full of islands and has low, richly-wooded shores.

The Karelian lakes are much deeper than those of the Lapland peninsula, and are probably far richer in fish, Koutojärvi, in particular, being celebrated for its fishery.

The lakes are generally frozen from the end of October to the middle of May, or about the same time as the White Sea; but it sometimes happens that the ice does not break up till towards the end of June. The frost is nearly always ushered in by snow, which prevents the formation of very thick ice. But for this, the shallower lakes would very likely freeze to the bottom, and the fresh-water fisheries would be destroyed. At the same time, lake and river communication, which is now open for about five months in the year, would be seriously interrupted.

Orography.—Eastward of the well-known track from Alten to the Gulf of Bothnia by Kautokeino, the Scandinavian mountains never resume their continuity, although the general uniformity in the fall of the ground is broken by several detached elevations. Thus there are three unwooded summits between the Pasvig and Lut rivers; and between Nuotjavre, the Kola River, and Imandra, are the following short ranges: Boats-oaivve[*] (in Russian, Olenja gora), immediately west of the Kola River; and the Volshe, Monshe, and Tshynedunder,[†] west of Imandra.

The highest and most extensive range in the eastern part of the peninsula, which, as already observed, is nearly insulated by the rivers and lakes between Kola and Kandalaks, is Umbdek-dunder, a serrated ridge on the east side of Imandra. According to the Russian traveller Middendorf, it attains an elevation of 2500 feet, and snow lies in the ravines, far down the slopes, all the year through. From Einemannevuon [‡] Umbdek-dunder runs in a north-easterly direction towards Lovozero, but it also extends to the southward, between Oktakanda and Kolvitsozero, terminating at Kandalaks in the four hills Savoaivantsh,

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[*] Lappish for "reindeer head"; probably so called because the reindeer resort to it to escape the countless swarms of mosquitoes which infest the lower grounds.

[†] *Dunder* is a Lappish word signifying "barren highland," or mountain.

[‡] *Vuon* or *vuodna* is Lappish for "fiord."

Ruvd-dunder (iron hill), Gask-dunder (middle hill), and Valaste-dunder (lower hill).

There is also an unwooded height between Umba and Varsuga, and several smaller elevations exist northward of the forest limits, where the ground is flatter than in the wooded country, and in other respects resembles the "tundras" of Siberia.

Marshes.—The whole of Russian Lapland is extremely swampy, and there are several extensive tracts of boggy ground. These are partially barren, partially covered by moss and heather, and partially overgrown by sedges (*carex*), which are used for fodder. The cloudberry (*Rubus chamæmorus*) is very plentiful on some of the marshy grounds, and rich grasses are also found in places, especially near the rivers and lakes. The three principal marshes lie between the Tulom and Kola rivers, between the Varsuga and Ponoi rivers, and between the Ponoi and Bavja.

In August 1867, Professor Friis could not find frozen ground in any of the marshes near Imandra at a depth of about one fathom, and the existence of welling springs which do not freeze in winter, points to the conclusion that within the forest limits the marshes are not frozen underneath like those of Siberia.

Ice-free Fiords and Harbours.—It seems to be the general impression that Russia is shut out from the Northern Seas, and has no safe harbour open at all seasons of the year, while the fiords of Northern Norway never freeze at all. According to various authors, "the boundary of Northern Russia"—that is, a small river on the south side of Varanger Fiord*—"corresponds to the limit of the Gulf Stream." "From this point," it has been further stated, "commences that belt of solid ice which locks up the harbours of the northern coasts of Russia for six months in the year. The change from open water to ice is no less abrupt than permanent." If this were true, it would indeed be an eccentric freak of nature. But while it is an exaggeration to say that the fiords of Northern Norway never freeze at all, it is altogether erroneous to say that the harbours of Northern Russia are ice-bound for six months in the year. As a matter of fact, that portion of the great ocean current which sweeps eastward from the North Cape along the coast of Norway, retains sufficient warmth to ameliorate the climate, and keep the principal harbours on the Murman coast open to navigation the whole year through, as far eastward as Sviatoinos, at the very entrance to the White Sea. From thence it takes a north-easterly direction towards Novaya Zemlya. Therefore it does not sink under itself, or turn sharp round and run straight out to sea on reaching the boundary, neither is it suddenly chilled by coming in contact with Russian civilisation. The distance to which the fiords of Northern Norway freeze, from the inner end outwards, depends upon the severity of the season, and the quantity of fresh water discharged from the different sized rivers. This

* The Jacob's River.

is also the case on the contiguous Russian coast; the inner parts of the longer fiords freeze more or less every winter, but the outer, deeper, and more important parts, are free from ice the whole year through. The harbours of Russian Lapland are in every respect equal to those of Northern Norway; they would make equally good naval or commercial stations, and the nearest is only 14 miles from the frontier. Russia has, therefore, no just cause of complaint against the Gulf Stream, and as the Murman coast is farther south, it is in some respects superior to that of Finmarken.

Fisheries.—The Murman coast is visited annually by about 3000 fishermen, of whom 1000 are Norwegians and Finlanders, the remainder being Russians and Lapps. Some of these men come from Brönö, on the west coast of Norway, a distance of not less than 800 nautical miles, in their open boats, for it is a maxim in the north that "he who would eat bread in winter must not stay at home in summer."

There are no less than 41 fishing stations on the Murman coast, and these again are divided into four groups, called the Western, Kola, Middle, and Eastern fishing districts. The Eastern district is but little frequented, and there are no huts at any of its eleven fishing stations.

The most important of all the species of fish caught on the Murman coast is the cod (*Gadus morrhua*). The fishery begins about a month later than in Norway, the shoals, followed by the fishermen, travelling from west to east. The cod seem to be confined to the waters of the warm ocean current, as they are not found to the eastward of Sviatoinos, or in the White Sea. Next to the cod, the following species are most worthy of notice from a commercial point of view:—The haddock (*Gadus æglefinus*), the green cod (*G. virens*), the tusk (*Brosmius vulgaris*), the bergylt, uer, or Norway haddock (*Sebastes norvegica*), the sea-wolf or sea-cat (*Anarrhichas lupus*), the halibut (*Pleuronectes hippoglossus*), the flounder (*P. flesus*), the common dab (*P. limanda*), with the capelin (*Mallotus arcticus*), and the sand-launce (*Ammodytes lancea*), the two latter being used for bait.

The Greenland shark (*Scymnus borealis*) is plentiful along the whole of the Murman coast, but especially off Kola. There is ample scope for the further development of this valuable fishery. The finner, razor-back, or rorqual (*Rorqualus borealis* of Cuvier), is also common, Captain Foyn, of Vadsö, having captured no less than eighty-one during the summer of last year. Herrings visit the shores of Russian Lapland and the White Sea in vast shoals; they are also caught at the mouths of the Ob and Yenisei, but the fishery is not carried on with the spirit its importance deserves. The salmon fisheries of the Murman coast and White Sea were formerly very extensive, but at the present time the annual yield of all the rivers in the Government of Archangel does not exceed 1,260,000 lbs., valued at 23,750*l.* sterling. Owing to the entire absence of control and proper supervision, the salmon fisheries are conducted in the most improvident manner both by Russians and Lapps; there is no close season, and the common practice of barring the rivers right across has a very prejudicial effect. The Lapland salmon are fat and well-flavoured, they often weigh from 40 to 50 lbs., and sometimes more. Salmon fishing begins later on the Murman coast than in Norway, and at Kandalaks and Kovda fish are sometimes not caught until towards the middle of August, neither do they run so far up the White Sea rivers as in those which fall into the Murman Sea.

Char, trout, gwiniad, grayling, perch, and pike, seem to abound in most of the rivers and lakes.

It is beyond the scope of this paper to enter into the various causes that have hitherto hindered the development of the rich fisheries of Lapland. At present the Russians are unskilful fishermen as compared to the Norwegians; their tackle is clumsy, and their method of preparing the fish when caught is primitive.

Game.—In the western part of Russian Lapland, swans, geese, ducks, and other migratory birds breed on the rivers and lakes; ptarmigan are plentiful on the open heather-covered ground; and in the thicker parts of the forests capercailzie are met with. There is always the chance of a shot at a bear, and wild reindeer are found on the high ground about Enare and Imandra. Eastward of the Kola River and Imandra, game appears to be comparatively scarce.

Colonisation.—The fisheries and other undeveloped industries of Russian Lapland offer a fine opening to emigrants from Finland and the Governments of Archangel and Olonetz. This is especially true of the north-western part of the country, where farming on a small scale has been made to pay by the few who have attempted it. But the social disposition of the Russians, who detest a lonely life and steady labour; the ill-health produced by frequent religious fasts, combined with the severe climate and scarcity of vegetables; the difficulty of obtaining legal protection where one officer and four subordinates have to uphold the majesty of the law along 460 miles of coast; and, above all, the wretched means of communication, have hitherto outweighed the inducements held out to settlers by the Russian Government, and Kola is still the only place on the Murman coast that is inhabited all the year round. On the south side of the peninsula, where colonisation has taken firmer root, there are 15 Russian villages, with an aggregate population of 3300. In 1859[*] the most important of these villages were Ponoi (containing 25 houses and 173 inhabitants), Pialitza (with 23 and 166), Tshapoma (38—243), Tetrina (58—355), Kusomen (55—334), Varsuga (54—249), Umba (69—461), Kandalaks (74—390), Knashja (22—125), and Kovda (57—406). Although some of these villages have existed for at least 200 years, they have made very

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[*] According to the census of 1861.

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life of a backwoodsman or solitary farmer. Hardy and independent by nature, the true Finlander likes to be monarch of all he surveys, and would rather endure hardship and toil than live in ease and comfort and own the control of a master. The Karelians and Quæns are nearly related, and their language is almost identical. In character, however, they differ materially, the Karelians having lost the perseverance, hardihood, and independence of their Lutheran brethren, without acquiring much of the enterprising spirit of the Russians. Ignorance, prejudice, and extreme poverty, are almost universal amongst the Karelians, but on the whole, the men are sober and industrious, the women chaste and domestic. A peaceful forgiving spirit is one of their most marked characteristics, and many of their national customs are peculiar and interesting. Owing to the scarcity of grain, the Karelians make bread with a mixture of fir-bark, straw, and damaged rye-flour. When used as a substitute for flour the inner part of the bark is stripped off, dried, pounded in a wooden mortar, and finally ground in a hand-mill; but when used in fish-soup it is simply chopped small. The Lapps inhabit the interior of the peninsula, each tribe being named after the territory to which it has a prescriptive right. They have, to a certain extent, adopted the manners and customs as well as the religion of the Russians, but though they do not wander from place to place with their reindeer like the true nomadic Lapps of Scandinavia, they are, nevertheless, frequently moving. In spring they generally disperse, the majority resorting to the smaller lakes for fishing and bird-catching, while some few go down to the coast and take part in the great sea-fisheries. Towards the middle of July the larger lakes are visited, and the salmon are trapped and netted with an utter disregard of everything beyond the requirements of the moment. In August they betake themselves to the autumn stations to hunt reindeer, martens, squirrels, otters, and bears. Finally, towards Christmas, they return to their winter quarters, where they live together in small villages called "pogosts." Each pogost has its own chapel-of-ease, and consists of from six to ten or twenty straggling wooden huts, the roofs of which are covered with birch-bark or turf. Every ten or fifteen years, when there is no longer a sufficiency of reindeer-moss and fuel in the immediate neighbourhood, the whole pogost, chapel and all, is pulled down and removed to a fresh site; the chapel is reconsecrated, and the huts and surroundings are well sprinkled with holy-water. Thus the villages never remain long in the same place, and are sometimes many miles distant from the parish church and parsonage. In dress and outward appearance the Russian Lapps differ but little from those of Scandinavia and Finland, but they have preserved more of their originality, and are far more ignorant, their knowledge of religion being almost confined to a parrot-like repetition of "Gospodi Jesuse Christe, süine boghii, pomilui nas!" (Lord Jesus Christ, God's Son, have mercy upon us). The dialects of the various tribes differ so much that the people of distant districts have the greatest difficulty in understanding each other. Their legends and traditions are full of interest, but their national customs are now almost extinct, though the "Skolte"* Lapps still go through the form of carrying off their brides by force from a hostile tribe.

Notes on New Guinea and its Inhabitants.

By the Rev. W. G. Lawes.

As some guarantee for the trustworthiness of the statements in the following account of New Guinea, I may say that I lived as an agent of the London Missionary Society, for three years, at Port Moresby and Hood Bay on the south-east coast of the island, from December 1874 to December 1877. During this time I made several journeys into the Koiari district in the interior, and more than one voyage along the coast to the east. Instead of giving a detailed account of these journeys, I propose to condense the information I gathered under several heads, in the hope that whatever may be lost in interest will be gained in brevity.

Geography and Physical Features.—New Guinea has an area of 300,000 square miles, and is the largest island in the world. It is separated from the northern part of Australia only by Torres Straits, and these are only 85 miles across at the narrowest part. British jurisdiction, however, extends much nearer than this to New Guinea. By the annexation of the small islands in Torres Straits the limits of the British Empire have been carried to within two or three miles of the mainland itself.

In an island so large, and presenting such great variety, it is of first importance to know to what part of it any particular statement refers. I have preferred to treat only of that which has come under my own personal knowledge, namely, the coast region extending from Yule Island to the extreme eastern extremity of the island, but more particularly the vicinity of Port Moresby and Hood Bay.

This part of New Guinea presents a striking contrast to the central part of the island, or that lying to the west of the Gulf of Papua. There all is lowland, not visible at sea a few miles distant. Here, further east, we have a lofty mountain range running all along the south-eastern peninsula, and reaching in Mount Owen Stanley the height of 13,000 feet.

The dangers of navigation on this imperfectly surveyed coast are greatly lessened by these grand, immovable landmarks. As you approach nearer the coast a lower range is seen to skirt it. Hills of every imaginable shape and height give variety and beauty to the landscape. Some voyagers have described these as fruitful and fertile, and have waxed eloquent in praise of the luxuriant vegetation, while others are indignant at such an account and speak of them as barren and sterile. All depends on the season of the year in which they are seen. Both descriptions are true. Nothing can be more green and beautiful than the hills after the rainy season, covered as they are with vegetation from their summits to the water's edge. And nothing can be more bare and uninviting than the same scenery after the grass has been burnt in the dry season. Stretches of sandy beach, with groves of cocoa-nut palms and queer-looking native villages under their shade, give a peculiar and picturesque character to the scene.

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* So called from a scrofulous affection of the head, which was formerly prevalent among them and deprived them of hair; it has been almost eradicated by the efforts of Norwegian doctors.

There are but few rivers of any size in this part of New Guinea. The Manumanu, discovered by Captain Moresby, the Laloke, the Hula River, the Kemp-Welch, and the Dundee, discovered by our mission, are all the streams of any size at present known. Some fine harbours have also been found, and by our frequent voyages in the mission steamer *Ellengowan* many reefs, bays, creeks, headlands, and islands have been added to the chart, thus increasing the safety of navigation on this much-dreaded coast.

New Guinea has long been supposed to be a country wondrously rich in all that constitutes the wealth of nations, but whatever its resources may be they are as yet undeveloped and unavailable. Gold has however been discovered, and it is impossible to foresee the result of this discovery, although at present it has been productive only of disease, disappointment, and loss to the parties who have been attracted to the locality.

The Flora and Fauna are to a great extent Australian. The country for miles is covered with coarse kangaroo grass, while the open forest country is studded with white gum, wattle, and other Australian trees. It is only near the water-courses and rivers, or in the gorges and ravines of the hills, that the vegetation is luxuriantly tropical. Here are the areca palm, the bread-fruit, wild mango and chestnut, the pandanus in several varieties, crotons of variegated leaf, crimson dracænæ, orchids and creepers in great variety, and ferns in abundance. Near the coast, and especially about Hood Bay, groves of cocoa-nut trees, miles in extent, cast their grateful shade.

Some districts are hungry and barren while in others food is plentiful, yet in all the bill of fare lacks variety. One almost wonders what the people live on, without any corn, rice, or potatoes. Bananas are everywhere plentiful. Yams are cultivated, but the supply is not great. In some districts taro, the staff of life in the South Seas, is abundant; while sugar-cane, pumpkins, melons, wild mango, and cucumber are found to flourish in others. Large quantities of sago are made from the sago

The fauna is also to a great extent Australian. Flocks of kangaroos, or wallabies, rush away from one's path in journ inland. The opossum, *cuscus*, flying phalanger, and bandicoot are representatives of the marsupials. I have had the honour of disco an *Echidna* or prickly ant-eater, also an animal of the marsupial closely allied to the North Australian species.

There are no large quadrupeds in this part of New Guinea. difficult for us to imagine a people who have never seen or hea horse, cow, or sheep, yet such is the case with the natives o Guinea. None of our domesticated animals are there; and no l tiger, or elephant roams their forests. Captain Lawson speak tiger, and some travellers in New Guinea believe in the existe a large quadruped of which droppings, tracks, and *almost* its s have been seen, but until further evidence is forthcoming th animal must be consigned to Captain Lawson's menagerie. The l quadruped known at present is the pig. This is found wild bush, and is also domesticated. Fat pork is to the natives o Guinea a dish deemed worthy of the gods, but not often conc mortals. We introduced a new species of hog, which is greatly I have seen a young native lady leading about a little pet wh with a string, and carrying it fondly when tired, just as some of l sisters of refinement pet and fondle their pugs and poodles.

The dogs of New Guinea are never to be forgotten. They resemble the Australian dingo, but are not found wild in th Every house has several, and the wretched animals have never l bark; they can only howl, but when one begins the dogs of th village join in chorus. A hundred cats in full concert are as in comparison with the noise of New Guinea dogs in the dea

Many of the birds are of Australian species; such as the "laughing jackass," and "leatherhead" of the Australian colc are very common everywhere along the coast, and parrots and cockatoos are very numerous. There are other bir of making and eating bird-of-paradise soup. It is very unparadisaical in its flavour. The cry of the bird-of-paradise is not easily mistaken; it is something between the quacking of a duck and the cawing of a crow. The mound-building fowl and the bush turkey are common, and so on the river banks are the magnificent crowned pigeon, the *Goura coronata*. These are not to be despised by the sportsman. The bird is as large as a small turkey, and the flesh white and delicate in flavour. The bird is in every sense king of the pigeon tribe.

The bower bird is peculiar, making a bower to play in and adorning it every morning. Hornbills (*Rhytidoceros ruficollis*) are very common in the forests in the interior. These make a great noise while flying, and were described by a voyager up the Baxter River as measuring at least 18 feet across, and making a noise like an engine dragging a luggage train after it! A species of cassowary is numerous on the plains in the interior, but I have never seen the birds. The natives hunt them, and they are the fleetest and strongest animal they are acquainted with. An old man who was praising me most energetically (he hoped I was going to give him a hatchet), having exhausted his stock of flattering adjectives, reached a climax by saying, "You are like a cassowary."

The Climate has hitherto proved very trying, both to Europeans and Polynesians. Lying near the equator, between 0° 22′ and 10° 42′ S. lat., the heat is naturally great and uniform. At Port Moresby, in 9° S. lat., the average maximum heat for the whole year was 86°·71, and the average minimum or night temperature 73°·5. February was the hottest month, when the average maximum was 90°·43, and August the coldest, when the average maximum temperature was 83°·3. During six months in the year the wind blows from the south-east, and the other six from the north-west. Towards the time for the change of the monsoon the wind is light and variable, but it can be depended on to blow steadily for four months in each monsoon. The rainy season is from January to May; 34 inches of rain fell in the year 1876, and most in April, when 58·6 inches were registered.

All foreigners have suffered much from malarial fevers. The natives are healthy, although they too suffer slightly from fever. Small-pox seems to have been epidemic about ten years ago, and was extremely fatal, but whence it came we know not. The natives are wonderfully free from European diseases. They certainly are not troubled with weak digestive organs, nor yet with sensitive nerves. They have no idea at all of medicine; disease is looked upon as a bewitchment, and treated accordingly. The climate of New Guinea will always be a serious obstacle to the development of its resources by Europeans.

The Natives of New Guinea present a great and wonderful variety. There seems to be a great commingling and admixture of race in a comparatively small area. Mr. Wallace, in his interesting book the 'Malay

Archipelago,' speaks of them as one race, and this opinion he has repeated more recently in an article in the 'Contemporary Review.' But those who have seen the natives in the south-east find greater difficulty in classifying them. All agree in testifying to the great variety of physiognomy and the apparent difference in shape of skull in almost every district. Whatever the true typical Papuan may be, I have seen natives who possess many of the characteristics said to be distinctive with others quite at variance with them. In a letter I recently received from Professor Giglioli of Florence, he speaks of having seen the large collection of skulls made by Signor D'Albertis in his voyage up the Fly River, and says: "The great variety in the shape of the crania of some of the inland natives has greatly puzzled me. Indeed, the only feasible explanation is that there has been a great mingling of races in that great island."

The difference in colour is very marked. To the west black natives are found, while from Redscar Bay eastward, a light-brown race inhabits the coast. On the mountains in the interior are people intermediate between these two in colour, and essentially different in all their habits. I should say these are the true aborigines of this part of New Guinea, while the coast tribes, black and brown, are probably settlers.

It is only of the light-coloured natives that I am speaking now; they belong undoubtedly to the same race as the New Zealanders, Tahitians, Samoans, &c., but are so split up and divided that every few miles of coast brings you to a people speaking a different language from those you have just left. These are often dialects, but are quite as dissimilar as those spoken in the various islands of Eastern Polynesia. Altogether I know of twenty-five different languages spoken in the 300 miles of coast I am personally acquainted with. My previous acquaintance with several languages of Eastern Polynesia was a great help in acquiring that of the people among whom I was living in New Guinea. I had the pleasure of reducing two of these to a written form, and getting books printed in them, and before I left New Guinea I had the greater pleasure of hearing some of the native children read fluently in their own language. This, of course, is a newly acquired art, and these books are the first in Southern New Guinea.

The natives of Port Moresby and district belong entirely to this light-coloured Malayo-Polynesian, or Sawaiori race.

The men are light in colour—a warm brown—and neither tall nor stout. They are muscular and well-developed, upright in their gait, and agile in all their movements. You rarely see the receding forehead and protruding jaw so characteristic of some dark races. Their noses are fairly-well formed, and their lips neither protruding nor thick. In some of the mountain tribes the hands and feet are remarkably small, and none of them would take an out-size in gloves or boots.

Many of them have intelligent and pleasing faces, and all the men glory in a huge mop of hair, which stands up all over their heads like a grenadier's cap. They stick a comb, which is merely a three- or four-pronged fork, into this, with a bunch of white cockatoo feathers at the end, as an ornament. Many of them are rather fine looking fellows, and they certainly owe nothing to the tailor's art; no one else can ever wear their clothes.

Scarcely any men of the coast tribes have a beard; every hair is carefully pulled out, and at times they shave off the eyebrows, and also the hair from the temples. They make up for the absence of hirsute appendages by nasal ornaments, in the shape of shell or stone nose-sticks. All have plaited armlets, so tightly plaited that it seems as if they must stop the circulation. These do for pockets; sweet-smelling shrubs, variegated leaves, and bright-coloured flowers are tucked in them, and if you search for stolen goods, the first thing to be done is to feel around the armlet.

In every group of men some are sure to be observed in mourning. Their hair is then cut short, and their bodies blackened all over. They may be seen in the morning busy with lampblack putting on a new suit. They never bathe during the time of mourning. The men always carry with them their weapons, generally a spear, sometimes a club, or bow and arrows. The stone club is really a weapon of the inland tribes, and is always obtained from them. The bow and arrow is also an imported weapon, and belongs to the black tribes further west.

So much for the men. The women match them. They, however, wear a decent girdle, or petticoat, which reaches from the hips to the knees, and they are all tattooed so closely that they look like a walking advertisement in the Chinese character. They think it increases the beauty of women, and were much surprised that my wife was not tattooed, especially as the white skin would show up the pattern so much better than their dark ones. Their ears are invariably pierced, very much pierced, for each ear has five or six holes made in it, and the whole ear is often weighed down by the number of ornaments worn in it. Tortoise-shell earrings are very nicely made, and many of these may be worn without much inconvenience. One of the belles of Hood Bay when I first saw her had twenty-eight such in each ear, and she was quite ready for more! They all delight in red beads, which are generally worn as necklaces, and sometimes as long pendants from the ears. Many of the young girls and most of the women have their hair quite short. These are the married ladies. Their heads are shaved when they are married! Barbaric as we may term these fashions, they are harmless. All their muscles and limbs have free action, they are stately and graceful in their movements, and their use of coloured leaves and flowers no rules of art could improve.

The position of women among the coast tribes is not so low and degraded as is often the case among barbarous races. They are proud and haughty, have very long tongues and know how to use them; in short, they are able to hold their own and sometimes a little more. The children are many of them very pretty, and all of merry disposition. Their ears are always pierced in babyhood, and their noses a few years later.

Native Houses.—In this part of New Guinea these are all built on piles, and we are everywhere reminded of the pre-historic lake villages of Europe. Port Moresby consists of two villages standing on the beach just below high-water mark. The houses are not built on a platform, as they are often represented, but the piles also form the posts of the houses. The natives live, as we should say, in the roof. They are made of thatch and wood, and floored with the sides of old canoes, which are adzed down to some approach to flatness. In the interior the floor is made of the mid-rib of the sago-palm fronds. It makes a light, springy floor, but not a good one to sleep on, as I can testify from experience. There is always a square fireplace, made with earth, in the centre of the house. You are a fortunate visitor if you go when the fire is out, and thus escape being blinded by the smoke. All along the coast the houses are built in the same way, with slight variations in the shape of the roofs. Some look like a whale boat, depressed in the centre, while others resemble the keel of a boat turned upside down. In many cases the village stands a good way out to sea, and is surrounded by water even at low tide. We could steam down the street of many of them in our little mission steamer, and in several cases we used to anchor alongside the houses. The boys and girls can sit in the doorway and fish. The houses are detached, but are generally connected by a pole laid from one verandah to another. The shoeless feet of the people enable them to run along these, and they laugh at our objection to so round and slippery a bridge. There *are* disadvantages connected with these Venetian abodes. A baby *does* occasionally fall through a hole in the floor, but then the water is soft to fall on, and the nurse can always swim, although an occasional crocodile sails round to see what dainty morsel he can find.

I have no doubt this custom of building in the water had its origin in fear of the aborigines of the country, the true owners of the soil. The builders were immigrant settlers, and they built their houses as they had been accustomed to do in the Malay Archipelago, and moored their canoes alongside so that they might be ready to escape if attacked by the inland tribes. One village which I visited at Hood Point was entirely destroyed, the people were living in their large canoes, and the charred posts of their dismantled houses testified to the origin of the custom. When, as in some cases, they have moved a little way inland, they still adhere to the same custom. Some of these inland houses are very large and handsome, with a tall thatched steeple to distinguish the abode of the chief. It must be remembered that in building no tool but the stone adze is used.

The Canoes of the people are the only artificial means of locomotion they possess, and furnish an interesting illustration of the earliest styles of naval architecture. All the coast tribes of this part of New Guinea are a maritime people, and are largely dependent on the sea, both for the means of subsistence, and of transit from place to place. The sea supplies many villages with most of their animal and vegetable food, for the fish caught are bartered with the inland tribes for the produce of the soil, and also for the spoil of the chase in the shape of kangaroo meat and wild pork. Hence every village has its fleet of canoes. These are of all sizes. At Port Moresby and the villages in that district they are of the roughest, rudest construction. They consist simply of a hollowed log, pointed at each end and attached to an outrigger. They are of different sizes, the smallest being these used for fishing on the reef, and easily carried by a couple of men, the larger ones are employed in making voyages along the coast, and in fishing for turtle and dugong; these latter are heavy, lumbering vessels, capable of carrying 12, 15, or even 20 people. All are propelled with paddles, narrow and unshapely, and also by mat sails. No New Guinean will ever paddle when the wind will do the work for him. He will wait all day for the wind, and only take to his paddle when compelled by sheer hunger. The natives very much admired our little mission steamer, because we could go against the wind, apparently without oars or sail. They wanted to know what medicine we had given her to make her go against the wind.

It is astonishing what large sails they carry, and how fast they will go before the wind. Long heavy paddles are also used as oars, fixed rowlocks being substituted by lashing to the gunwale. When longer voyages are undertaken, four or five, and even ten canoes are lashed together. These are decked over with poles, houses are built at each end, covered with thatch, and a sort of bulwarks made of the same material all round the sides. A mast is raised, consisting of the stem of a small tree with its principal roots, which latter are lashed to the deck, and then a huge mat-sail, crab-claw shape, is hoisted by a rope passed over a fork at the top of the mast. A more unwieldy, unseaworthy-looking craft it is impossible to conceive, and yet they make long voyages in such a vessel to places 200 miles distant. They have been aptly described as huge floating hay-stacks. As they can only run before the wind, the crew choose the end of one monsoon to go to their destination, waiting the setting in of the other to return.

At Hood Bay, farther along the coast, the canoes are much finer. Double canoes of all sizes are there in favour. The women can paddle their own canoes quite as well as the men. I have seen a double canoe propelled by 24 women, flying over the water in the lagoon, the women keeping perfect time with their paddles, every arm lifted at the same moment, and every paddle turned simultaneously. As you get further to the east, the style of canoe improves. Elegant and elaborate carving adorns all the canoes about Orangerie Bay. Many are very long and well shaped, with seats for as many as 18 paddlers. Sometimes two are lashed together, while the captain sits on a raised deck between them. The war canoes of this kind are most elaborately decorated with carved figure-heads, painted black and white, and decorated with abundance of streamers. Some, again, look like an English whale-boat, built with knees inside and planks sewn together. I examined one of these and found the keel was like that of an ordinary canoe, the upper part being built up from it. But these too had an outrigger attached.

The Occupations of so primitive a people are particularly interesting; for iron and its uses are unknown, and among them the stone age still flourishes. They are all gardeners, and cultivate the soil carefully, though their agricultural implements are few and simple. Plough and harrow, spade, rake, and hoe, are all contained in a couple of pointed sticks. One stick is inserted five or six inches into the soil, and then the other at an angle with it; with the leverage thus obtained a sod is turned, and this being done in regular order, a field looks, when finished, almost as if it had been ploughed. Bananas are planted in these furrowed gardens. In other cases the large sods are broken up, the weeds picked out, and the whole smoothed over by the said stick, until it has the appearance of a well-raked, carefully cultivated English garden. The men do the heavier work of digging, while the women plant and weed. All their gardens are enclosed by well-made fences.

They are also all hunters and fishermen. They hunt the kangaroo and wild pig. With no other weapon than a smooth-pointed spear and a coarse net, they obtain enormous quantities of kangaroo meat. In the dry season, when the coarse grass is tall and dry, they have the grandest hunts and the richest spoil. All the men and boys of the whole village join in the sport. They select a tract of land on a day when the trade-wind is blowing steady and strong. They then pull up the grass in a narrow belt to leeward, and along this place their nets, which are large-meshed and strong, about five feet high, each man's being joined to his neighbour's, so that there is a continuous net fence right across one side of the hunting ground. The men stand behind this with their spears and dogs. The grass is then set fire to all along the line to windward. The fire and smoke, with the shouts and yells of the excited boys, drive the dazed and frightened game up to the nets, where their chances of escape are very small. The natives eat nothing before they start, and are often not home till night, when, if they have been unsuccessful, they get a very warm reception from their wives, who have wood and water ready to cook the supper.

When hunting is impracticable, fishing takes its place; men and women all fish, but not often together. They use nets of different kinds, but fishing with a hook and line is unknown in this part of New Guinea. The nets are all well made by the men, who also have to prepare the flax and twist the cord of which they are knitted. The women excel in making netted bags of all sizes. The large ones are used by the women to carry their burdens in, and also as cradles. They are interesting, too, as the only article I have met with which is also made by the aborigines of Australia.

Making the shell and other ornaments occupies a good deal of time. While there is very little division of labour, yet each village has its speciality. Some make nose-sticks, others shell necklaces, others armlets, and so on, according to the abundance of material in each place for one special manufacture.

Cooking, of course, occupies a good deal of time every day. It is not very elaborate or complicated, and is performed by the women. They have no vessel of tin, iron, copper, or any metal whatever; nor oven of any kind. Most of the food is boiled, and before it can be cooked the women have to make the pot to boil it in. They make very good pottery, which is slightly burnt, after being dried in the sun. They use no wheel, and yet they make well-shaped globular vessels, both for fetching water and cooking food. Roasting, or rather drying over a slow fire, is often practised when they wish to keep the food a considerable time, as when they are away from home hunting.

The South Sea Island mode of cooking with hot stones is also used, but principally by the inland tribes. All their food is well cooked. They look upon us as barbarous for eating our meat, as they say, half raw. This does away altogether with the idea of gnawing and tearing which we generally associate with eating without knives and forks. The water in which food has been boiled is generally drunk, even when it is fish broth. This is their only warm drink. Tea and coffee are unknown. They have no intoxicant, and are content and healthy with no stronger beverage than the fresh coco-nut and running stream afford.

Barter sometimes takes a good deal of time. They have no currency, and have never felt the want or known the use of money. Bartering is the women's department, and well they know how to drive a bargain. I went to a regular fish-market at Hood Bay, where I was the only man present. The noise of the women, haggling and disputing, was varied occasionally with language more forcible than elegant, but of the character which has made Billingsgate proverbial. Most of the fish bartered in this coast village would be again exchanged with the inland people for vegetables and fruit. They would get for one fish as many bananas as they gave for two the day before. Quick returns and cent. per cent. profit are the New Guinea ideas of legitimate trade.

The Eastern custom of fetching water at daybreak by the women prevails in New Guinea. They carry the chatty of water on the shoulder or head. It is a healthy exercise, and may be commended to young women everywhere as productive of a good gait, an upright figure, and robust health. The women of the village meet in the early morning with their water pots, and sitting down to rest discuss the politics, circulate the news, and spread the village scandal.

When food is plentiful, the day is generally closed with a ball in the open air under the coco-nut trees. The young people dance, while their seniors look on and criticise or commend. They will often keep up the dancing to the monotonous music of their drums until the small hours of the morning.

Customs.—Many of the habits of the people are peculiar. Their mode of welcoming strangers, is by the strange and not very graceful operation of putting the hand to the nose and then to the stomach. This seems to be the orthodox way of expressing sentiments of peace all along the coast. Captain Moresby, in his very interesting book, gives a most ludicrous description of his officers standing on the quarter-deck and going through this inelegant mode of salutation. Shaking hands is unknown, and that other mode of expressing affection, which is sometimes thought to be a relic of Paradise, is also unknown; they pass through all the stages of infancy, childhood and youth, courtship, marriage, and old age, without either kissing or being kissed. Among the inland tribes a very curious mode of salutation prevails. They welcome their friends by chucking them under the chin!

Even these rude and barbarous tribes have their recognised rules of politeness and etiquette which are rarely violated. They generally differ from ours. It is bad manners to meet any one without asking him where he is going, or to deliver a message to a superior standing.

There are many rules of taboo which are observed scrupulously by the people. It is sacred or taboo, for instance, to speak to a man when he is going hunting, or to make a noise in the village when the nets are hanging out previous to turtle fishing. The violation of any of these rules is supposed to bring misfortune. At Port Moresby the people are all inveterate smokers of tobacco. The custom does not seem to have been borrowed from white men. The origin of tobacco and of smoking the dried leaves are attributed, in a legend, to a woman in the district of Elema to the west of Port Moresby. Among the inland tribes a custom prevails in smoking similar to the drinking of healths in other parts of the world. When the bamboo pipe is filled with smoke and ready for inhaling, the man shouts out the name of the friend he wishes to honour, before taking a whiff; he then passes it on to the next, and he shouts out in the same way, and so on all round the circle. In one case when I was journeying in the interior I had supplied my host with tobacco, and far into the night I heard my name as the pipe went round, "Misi Lao kuku e!"

Far more common in New Guinea than smoking is the practice of chewing the betel nut. For this three requisites are indispensable, the nut which is the fruit of the areca palm, the leaf, bark, or catkin of the betel pepper, and quicklime. The gourds for holding the lime and the spoons for dipping it up are often most elaborately carved and ornamented. Where it is at all plentiful a chief is never to be seen without his apparatus for betel chewing, and the rattle of the spoon in the gourd is incessant. The teeth are soon made quite red by chewing, and if persisted in become perfectly black. When a man's ivories have become ebonies the New Guinea ladies pronounce him very handsome.

The burial customs vary in the different districts. In most cases affection is shown by keeping the body unburied long after it has become repulsive. Some most disgusting and revolting rites are practised, but they afflict themselves in their grief, and as an expression of love and sorrow.

The Government, such as it is, is patriarchal. Each village is independent and has its own chiefs. These have very little power over individuals, but have influence in matters affecting the whole village. The office is hereditary, but, I believe, is dependent on the energy and force of character possessed by those who inherit it. The son of a chief who is weak-minded and a fool soon sinks to the common level, while a commoner who is strong and brave, with greater mental power than his fellows, comes to the front and is soon recognised as a chief. It must be remembered that the communities are always small. A village of 2000 inhabitants would be a great city in New Guinea. There is no judicial punishment for crimes of any kind. I remember one of the chiefs of Port Moresby coming down the road from the interior one day sobbing and crying like a child. I thought some of his family must have been killed, but when I asked him what was the matter, he replied, between his sobs, "I had some yams fit to dig and somebody has stolen them"—and he began to *bohoo* again.

The Moral Condition of the people is deplorably low. All are thieves. From the earliest age the children take an active part in the depredations of the family. They are clever and ingenious in their pilfering, and would soon take a high degree among the light-fingered fraternity of any part of the civilised world.

No sense of shame seems to be felt by any of the natives in stealing. One village on a small island in Fairfax Harbour had no gardens, and was known to live by depredations on the grounds of the more industrious. The first intimation we had of the loss of some of our goods was from the thief bringing the stolen things to us and offering them for sale. We were looked upon as great wonders by the natives because we did not steal, and our honesty was always mentioned in any description of us as one of our peculiarities.

Human life is invested with no sanctity. The distinction the men are most proud of is that of having shed human blood. Many of the men are tattooed on the chest and forehead, not as a personal ornamentation, but as a mark of distinction. They are more proud of this than of anything else which they possess. The meaning of it is that the man so distinguished is a murderer. He has no right to be tattooed until he has killed some one.

A man came to see us one day at Port Moresby from another village. He had rather a pleasing face, was quiet and mild in his manner, and very intelligent. He had a queer-looking collection of rubbish hanging round his neck, consisting of pieces of wood, bone, stones, tufts of hair, and so on, numbering upwards of twenty. I asked what these meant, and with evident pride he told me each of these represented some one he had killed.

Cannibalism still flourishes on many parts of the south-east coast of New Guinea. It is a vice that does not add to one's comfort when going about among the people who practise it. A gentleman who went with our party on one occasion, and who was felt all over by the admiring natives, described his sensations as unpleasant, for he could not help thinking of the joints in a cookery book marked out for carving.

The warfare of the natives is not very deadly, but they are not often on peaceful terms with their neighbours. They are exceedingly suspicious and distrustful. They never sleep without their weapons within reach, and never go out without spear or club. They came to our house readily enough at first, but the slamming of a door or any unexpected noise was enough to bring them to their feet.

We were glad to miss the vice of drunkenness in New Guinea, and all the catalogue of evils which arise from the abuse of intoxicating drinks. There is not much *open* immorality of a particular kind. It was only when I returned to civilisation that I saw vice reeling along the street and standing brazen-faced at its corners.

The family tie is strong and lasting. A man lives with his wife and children in decency and peace. Polygamy is not common, although it is thought to be the proper thing for a chief. At Hood Bay the practice is limited by the fact that each wife requires a new house and a separate establishment; while at Port Moresby, one of the chiefs told me the one he had was such a scold that he daren't have another.

There is a pretty equal division of labour between the men and the women, although some work falls to the women's share which we think the men ought to do. The women, however, resent any interference on the part of the men with the fetching of wood and water, or the carrying of burdens, as an infringement of their woman's rights.

Religion.—No religious system has been found in this part of New Guinea. There are no idols, and the people are not idol-worshippers at all. They seem to have no idea of a god as a supreme being, or a good spirit. Their only religious ideas consist in a belief in evil spirits.

They live a life of slavish fear to these, but seem to have no idea of propitiating them by sacrifice or prayer.

They believe, too, in the deathlessness of the soul, but their ideas as to its abode or condition are very vague and indefinite. A death in the village is the occasion of bringing plenty of ghosts to escort their new companion, and perhaps fetch some one else. All night the friends of the deceased sit up and keep the drums going to drive away the spirits. When I was sleeping one night at Hood Bay, a party of young men and boys came round with sticks, striking the fences and posts of houses all through the village. This I found was always done when any one died, to drive back the spirits to their own quarters on the adjacent mountain tops.

But it is the spirits of the inland tribes, the aborigines of the country, that the coast tribes most fear. The road from the interior to Port Moresby passed close to our house, and the natives told us that the barking of our English dog at night had frightened the evil spirits so effectually that they had had no ghostly visitors since we came. I was camping out one night in the bush with some coast natives, at a time when a number of the natives of the interior were hunting in the neighbourhood; noticing that the men with me did not go to sleep, I asked if they were afraid of the mountain men, "No," they replied, "but the whole plain is full of the spirits who come with them."

All calamities are attributed to the power and malice of these evil spirits. Drought and famine, storm and flood, disease and death are all supposed to be brought by "Vata" and his hosts, so that the people are an easy prey to any designing individuals who claim power over these. Some disease charmers and rain-makers sometimes levied heavy toll on the weak-minded and superstitious people. They seem, however, to have no idea of sacrifice, worship, or prayer, by which to avert their wrath or secure their favour. Much difference, however, will be found in these matters in the different tribes. Among some there seems to be a vague recognition of a great spirit who gives them plenty and other blessings; and to the west of Port Moresby, in the district of Elema, are idols and idol temples, but the natives there belong to the darker coloured race.

Products and Resources.—From long observation on the spot I am convinced that many of the reports that have been propagated as to its products are false or exaggerated. The list of products is not a long one, but it comprises many of great commercial value, and it must be remembered that the country is more than three times the size of Great Britain, and with the exception of a few small districts near the coast, wholly unexplored. The places at which many of the articles are found are widely scattered, and the quantity in many cases very limited. Whatever its resources may be commercially, they have yet to be developed. Its colonisation by Europeans I believe to be impracticable. The unhealthiness of the climate has been proved by all who have landed at any part of its shores. The list of the products of New Guinea should always be headed by fever and ague, for, whatever else is found, these are sure to be at hand.

It is through the elevation and civilisation of the natives that the interests of commerce and science will be best served and the resources of the country made available. They had previously borne a terrible character for cruelty and savagery, but we found them amenable to kindness.

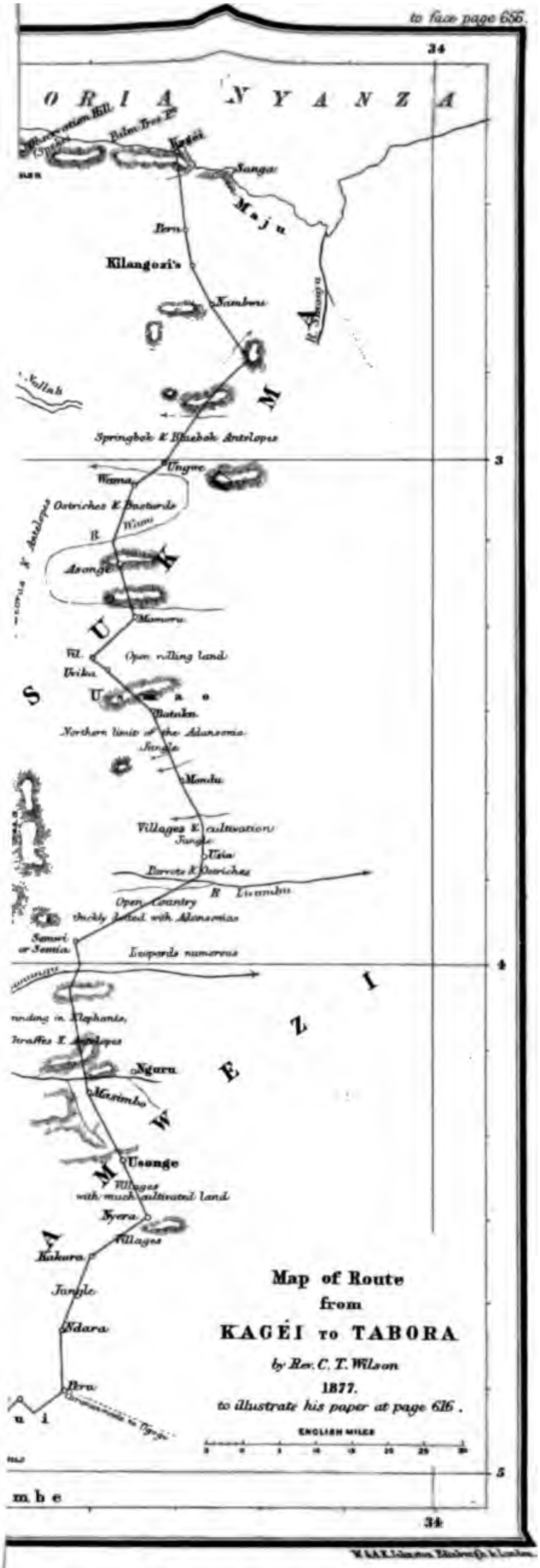
I was glad to read in the report of the Geographical Section of the British Association meeting at Sheffield, that several travellers from Africa had said a good word for the cannibals. I should like to do the same for the cannibals and non-cannibals of New Guinea. I have visited a great many villages, in most of which no white man had been before, my wife and I were for a time the only Europeans living on the island, but I have never been molested anywhere. We are known along the coast as the bearers of peace. As I went through one of the villages for the first time, a native from another ran before us and shouted: "These are the 'maino taunas,' the peace men, who bring and make peace everywhere." Confidence begets confidence, and there is a wondrous power in human kindness. If barbarous races like these had always been treated with kindness, fairness, and honesty, there would have been fewer massacres to record, and some of our most discreditable wars would have been prevented.

A Journey from Kagéi to Tabora and back.

By the Rev. C. T. Wilson.

Early in the year 1877 I had occasion to cross the Victoria Nyanza, from Uganda to Kagéi, for the purpose of investigating the circumstances connected with the death of Lieut. Shergold Smith and Mr. O'Neill, and before I was able to return found myself compelled to undertake the long journey to Unyanyembe, in order to lay in a fresh supply of cloth and beads. Having followed, for the most part, a route different from that of all previous European travellers, the following notes made by the way will be useful to geographers.

I left Kagéi on January 19th, and stopped the first night at a large village, about six hours from Kagéi, the chief of which had been my kilangozi, or guide, on part of my journey to the Nyanza from Zanzibar. The country here and as far as Mamora, about lat. 3° 20′ S., consists of open grass-covered downs, with ridges running generally in a westerly and easterly direction, with swampy valleys between, down which sluggish streams make their way, either to the Shimiyu or to the small rivers which run into Jordan Nullah. The ridges are often crowned with masses of igneous or metamorphic rocks, which furnish



Map of Route
from
KAGÉI TO TABORA
by Rev. C. T. Wilson
1877.
to illustrate his paper at page 616.

W. & A. K. Johnston, Edinburgh & London.

r the Proceedings of the Royal Geographical Society 1880.

nesting places to large flocks of doves. Cattle are abundant here, and there is a large amount of cultivation; mtama, mwere, mhindi or maize, ground-nut (*Arachis hypogæa*), and sesamum, being the chief products. The people are, as a rule, very friendly, and will frequently bring one presents of milk, maize, and ground-nuts. There is scarcely a tree to be seen in this part of the country except round the villages, where a few gigantic species of ficus are found, affording a refreshing shade from the noonday sun, and forming the lounging places of the villagers, while a species of euphorbia (*Euphorbia antiquorum*?), which grows to a height of twenty to thirty feet, is used for hedges round the villages and between the various farms or gardens. Various species of small antelopes are found in herds, and flocks of bustards and a few ostriches roam over the plains. The third night brought us to Ungwe, a wretched little village near the River Wami. Next day we crossed the Wami, which was here about three feet deep and 80 yards wide, flowing west at about a mile and half an hour. We stopped at the village of Wama after about two hours' march. The people here are very primitive with regard to their clothing. The children go about entirely naked, and the unmarried girls wear a short apron of skin, the grown men and married women wearing a dressed goat-skin slung across the shoulders, which comes down to the knees and more or less envelopes the body. The articles of barter most valued here are small opaque white beads, known as "merikani." A small quantity of red rice is grown; it is smaller in the grain than the ordinary rice, and the husk is of a reddish-brown colour; it is an inferior kind, but I was very glad to get it, having been without rice for many months.

Our next march was to Mamora, crossing the River Wami twice, the road lying through the valley of the Wami, and being terribly swampy owing to rain, a good deal having fallen this month (January), a time when generally there is little or none. From Mamora to Uvika was a terribly hard journey, the soil being a stiff clay, much cut up with the hoofs of cattle, and further on being under water to the extent of two to three feet. Here we encountered an acacia jungle, the first since leaving the lake; it swarms with brindled gnu, zebra, and various species of antelope. I tried to get a shot at some of the latter, a very handsome species with bright bay coat, black legs, face, and belly, and curved spiral horns; but there was not sufficient cover, and I could not get within range. From Uvika we proceeded to the village of Bataku, in the district of Usmao, crossing a good deep stream just before reaching the village. Cattle are abundant here, and I got a present of fresh milk from the local chief. The neighbouring country is in rather a disturbed and unsettled state, the people living in constant dread of being attacked by Mirambo and his Ruga-Ruga. On my return I and my party were taken for these dreaded robbers, the whole district turning out to resist us, and it would have fared badly with us but for the timely appearance, like a "deus ex machina," of an old niampara, or chief, who had once travelled with me, and who took my part against the excited villagers. Everything here shows that the people are in constant dread of invasion; the villages are surrounded by strong thorn fences, with narrow openings, which can be easily defended by a few men, the cattle are sent out to graze under strong armed escorts, and even the farmer when at work in his mtama fields, has his spear stuck in the ground beside him, ready for a fight.

The district of Usmao is the northern limit of the *Adansonia digitata*, or baobab, in this part of Africa; proceeding northwards it is not again met with till the Bahr el Ghazal system is passed, i. e. about 12° N. lat.

From Usmao onward the country is covered with dense jungle, with a few clearings here and there, till the River Livumbu, or Liwumbu, is reached. Buffaloes and antelope are found here, partridges are numerous, and yellow and green parrots abound. Several streams are crossed, but none of any importance, until we reach the Livumbu. This river was about three feet deep and 60 yards wide on all the three occasions when I crossed it, but its banks bear evident token of its having often as much as 20 feet of water in it. South of the Livumbu the country is open, with much cultivation, and thickly dotted with Adansonias, which seem to reach their largest size here. It is spared by the natives, partly on account of the difficulty in felling it, and partly because of the valuable rope which is made from its bark. This rope is very strong and, unlike much of the native rope, very pliable, so that we found it made excellent running rigging, and we used it largely for halliards in our boat. At Semwi, or Semia, lat. 3° 55″ S., I stopped a whole day, as the River Monungu was reported to be impassable. Leaving this on January 30th, three hours brought us to the banks of the Monungu, having first crossed a backwater in which the water was up to our necks. Arrived at the river we found it in full flood, with some 20 feet of water and running like a mill-race. There was a rude bridge of trunks of trees thrown across, the river being only about 30 yards wide, but this was three feet under water, so I set men to cut long creepers, and having made a strong handrail we crossed by holding on to it and feeling for the logs below with our feet. This was a work of several hours, so when all were over we camped in the jungle on the opposite bank of the river.

The jungle here swarms with game; elephants, buffaloes, giraffe, rhinoceros, eland, gazelle, bluebok, baboons, &c., and the lions kept up a perpetual roaring round our camp, attracted by some cattle we had with us. Next day we reached Masimbo, a strong village near Ng'uru, one of the districts of Northern Unyamwezi. There are a number of hills here, and among these hills I believe that the Munungu has its rise, and that here lies the watershed between the Nile and the Lufigi. The district between the Monungu and Masimbo is jungle, and haunted by Ruga-Ruga, not, however, Mirambo's renowned warriors, Ruga-Ruga being a name for all highway robbers. There is a large amount of cultivation, maize or Indian corn being much more largely grown here than it is further north. From Masimbo I proceeded to Usonge, a collection of villages under the chieftainship of Mtinginya, a blood brother of Mirambo; his people came rushing out to meet me as soon as I appeared, and received me with every demonstration of joy. I was taken to Kwikurru, or the capital, and a good hut was given me and a present of a fine fat bullock, which was so wild that it had to be shot. One of Mtinginya's men attempted it, but missed the animal at 20 yards, which raised such a shout of derisive laughter that he retired in disgust.

I will just say a word here about the government of Usukumu and Northern Unyamwezi. The country is divided into a number of districts, each of which is ruled over by a head-chief or monungwa, under whom are a number of lesser chiefs who are called niampara or grandfather, and it is under these niamparas that the porters or pagazi go down to the coast to engage in caravans going up into the interior. The village where the monungwa resides is called *kwikurru*, a Kinyamwezi word meaning "capital"; the frontier villages of each district are called *péru*. These different districts are constantly at war with one another, the object being to seize slaves and cattle.

Leaving Usonge we passed through a considerable extent of cultivated country, and then entered jungle through which our road lay for some hours. On emerging from the jungle we heard heavy firing on our right, and soon saw about 300 of Mirambo's Ruga-Ruga attacking a strongly fortified village; the whole district was up, and armed men were seen running to the encounter from all sides. We quickened our steps, not wishing to be drawn into the affair. On every house-top were sentinels who challenged us as we drew near, and at one village a fine-looking niampara ran after me and told me not to let my caravan halt in the district, but to go to a village some miles beyond, where he said the chief would take us in.

From Usonge to Uyui the country is very monotonous, consisting of flat country with alternate patches of jungle, and clearings in the neighbourhood of villages where large quantities of maize and mtama are grown. At Nyera, from a bit of rising ground, we get the last glimpse of the Usanda range of hills which form a conspicuous landmark for several days' journey. At Ndara we first meet with the banana; but the fruit is very poor compared with that of Uganda. Near Uyui white rice is grown.

On February 8th I reached Uyui, the capital of the district of that name. The town is a very large one for Central Africa, containing, I should think, from 4000 to 5000 inhabitants. It is strongly fortified with a palisade of whole trees and a ditch, and many of the people possess guns. The chief is known by the name of Majembe Gana, or "The hundred spades," from the following circumstance: Some years ago Mirambo, who was not as strong as he is now, had been making a raid to the east of Uyui and wished to return home by that place, but not knowing how the chief of Uyui was disposed towards him, he sent men to him with a hundred hoes and a hundred bullets, with the following message, "If you wish peace take the hoes and till your fields with them; if you wish war take the bullets, for you will need them all." The chief preferred the hoes, and was ever after known as Majembe Gana. He has since lived on good terms with Mirambo. There is a dense population about Uyui, and large quantities of rice, maize, and mtama are grown in the district. The Church Missionary Society has now a station there.

The country between Uyui and Tabora is almost entirely jungle, and abounds with large game; there are also many lions which commit great havoc at times among the cattle and goats.

I remained five days in Tabora, living in the house of Sheik bin Nasibu and brother of Abdullah bin Nasibu, called by the Wanyamwezi Kisesa on account of his valour; both of these men will be familiar to readers of Mr. Stanley's books.

I returned to Uyui on February 16th, and remained there five days more, being during that time the guest of Said bin Salem, the former governor of Unyanyembe, and the old friend of Burton, Speke, and Grant, as well as of Majembe Gana.

I set off from Uyui on my return journey to Kagéi on February 21st, and arrived there on March 15th. I took the same route as on my journey down, as it was the shortest and I was pressed for time. An immense quantity of rain had fallen during my stay at Uyui, and much of the country was flooded. We were delayed two days by the Monungu River, and when we did cross it the water on the northern bank was up to our necks. I think there is no doubt that this enormous amount of rain produced the extraordinary rise of two feet in the Victoria Nyanza at a time when it is nearly at its lowest in ordinary years, and contributed materially to the unusually high Nile which occurred later on in that same year.

Shorawak Valley and the Toba Plateau, Afghanistan.

By Major W. M. Campbell, R.E.

Shorawak Valley.—The Shorawak Valley was only known to Europeans by hearsay until visited during the recent campaign. Having been fortunate enough to make one of a party which visited the northern end, I offer a few brief notes of that district, which I believe to be very similar to the rest of the valley.

The valley is a narrow strip of very flat level country, lying between the desert on the west and north-west, and a range of hills, generally known as the Sarlat Hills, on the east. Its general direction is about north by east, and south by west; the width at the northern end is about 10 miles, only six of which however are arable, the rest being a stony slope up to the foot of the Sarlat Hills. The total length is probably about 40 miles. The elevation of the northern end, or head, is about 3250 feet above sea-level, according to the best data at present available.

The head of the valley to the north is closed in by the Tang Hills, or southern spurs of the Khwaja (Khoja) Amran range of mountains, which here nearly join the north-western spurs of the Sarlat Hills, only leaving a gap of about a mile through which the Lora River runs into the valley.

The desert (which stretches away westward as far as the Persian frontier), rolls up in the form of sand-hills to the edge of the cultivated land of the valley, where it stops abruptly. There can be little doubt that it is encroaching on the valley, although the natives say that it is not. The sand-hills on the edge are sometimes about 100 feet high, with steep slopes towards the east, and their crests are very unstable, with the appearance of constantly shifting eastward before the prevalent westerly winds. It has certainly stolen in round the north-west corner of the valley until stopped by the hills. There is a curious isolated patch of sand-hills in the north-east corner of the valley, which have almost certainly resulted from a drift from the desert, though there is now no connection.

The valley is watered by the Lora River, which enters at the north end in a shallow, stony bed with low banks, but soon falls below the surface and traverses the length of the valley in a deep, wide bed, with high perpendicular banks. The height of the river at the north end of the valley is taken advantage of for the formation of irrigation channels, which are very numerous and extensive. The water supply is considerably assisted by a lake in the middle of the valley, near its north end, which is filled by overflow from the river when flooded, and acts as a reservoir. The Lora runs nearly dry in summer and its waters are always brackish, whence the name of the valley—from the Persian words, *shor* = brackish, and *ábak* (whence *áwak*) = scarcity of water.

The soil is a light, friable loam, very fruitful under irrigation. The crops chiefly grown are wheat and barley, and when water is abundant sometimes Indian corn. The system of tilling is to take one crop in three years, leaving the land to lie fallow for two. Flour-mills driven by water are numerous.

The valley is thickly populated, the inhabitants being a mixture of Barechi Pathans and Brahuis, who possess large flocks of camels, goats, and sheep. The valley is almost destitute of trees, as is generally the case with the country at large. It can hardly be doubted but that most trees would grow in Shorawak. A curious feature in the valley is the existence of extensive mounds of evidently artificial origin, but as to which I could discover no legendary knowledge, the only answer the natives gave to questions on the subject being that these mounds were very old.

The origin of the valley itself seems somewhat obscure, for it is difficult to understand why the desert should come to an end where it does, instead of extending a few miles farther east, to the base of the Sarlat Hills, as it does in the case of hills a little farther north.

The following seems a possible explanation. The alluvial nature of the soil of the valley, and the general dead level of its surface, suggests at once its original deposition in still water. But it certainly could never have been deposited by the Lora River under present conditions, for, as already mentioned, that river runs in a bed many feet below the surface of the soil. It is suggested that the valley was once a lake, and that its basin became gradually silted up by deposit from the Lora, which fed it. If then the water from some cause forced its way out at the southern end of the valley, the present state of matters would have ensued, even to the formation of one or two false channels of the river, which now exist. For the water would at first drain off partially from different tracts, until one main channel had been worn out, sufficiently deep and far enough back to reach the river at the head of the valley and drain its whole volume as at present. The existence of such a lake would account for the desert ending where it does, as its progress while the lake existed must have been stopped by the water. It would also account for the patch of isolated sand-hills already noticed at the north-east end of the valley, as the sand might have drifted round the head of the lake, where the river was—and is now—in a high gravelly bed. Such a drift now would be stopped by the cultivation. Is it not possible also that the supposed lake may account for the existence of the artificial mounds mentioned? When its bed began to dry up, the richness of its soil would attract population, when its extreme dampness, and liability to floods (which must have been very great for a long time) may have led to the foundation of these mounds as village sites.

An interesting feature in the River Lora is that after flowing through the valley it enters the desert, where it is swallowed up in the sand. It has formed, I believe, an extensive swampy district, beyond which it never reaches, notwithstanding the very large body of water which it must discharge after rains.

The curious water channels of the country may be here mentioned, although they do not occur in Shorawak. They are called *karézes* (or *karéz* in the singular) and are constructed by a special class of men, who go about the country in gangs for the purpose. These men were originally Ghilzais of Kabul. The method is to sink a well where the presence of water is suspected, until it is struck, when it is led away by an underground channel till the slope of the ground enables it to reach the surface. The channel is made by sinking wells at convenient distances, and excavating between them, and must sometimes be a great depth below ground, judging from the slope of the surface. It is difficult to see down the wells when deep, besides which they are often filled in above the channel. The number of these karézes is in places very great, dry ones being frequent, probably owing to their water supply having been tapped by more recent constructions.

Toba Plateau.—Much curiosity has been felt about a high table-land called "Toba," reported by the natives to exist on the north-eastern extremity of the Khwaja (Khoja) Amran range of mountains, and variously described by them as a place of great attractions, and the reverse.

Nothing has hitherto been known of this district, except from these native reports, and from a description of the route over the eastern extremity, from Ghazni to Quetta, which was followed by a brigade of the army in the old war.

A party—of which I was one—was organised in May 1879 to visit Toba, for the purpose of surveying and reporting generally on the country; and in the following notes I shall try to give a rough idea of the results of our reconnaissance.

The crest of the Khwaja Amran bifurcates at a short distance north-east of the Khojak Pass, and from there follows two lines—one nearly due eastward, and the other with a direction about N.N.E. Between these two crests is an elevated mountain mass, which extends eastward until it merges in the general confused mountain system of the country in that direction. This table-land has always been known as Toba, but we now find that it is divided into two portions called Toba and Tabin.

Tabin occupies the whole of the western portion of the table-land, and Toba the southern edge to the east of Tabin. They are separated by a narrow line of hills running about north-east by east, on the north side of which the surface of the table-land becomes a confused mass of hills, so that Tabin and Toba comprise all the fairly level ground.

The plain country of Tabin may be considered as a triangle with sides of about 13, 13, and 14 miles in length, within which the surface is undulating, with open valleys and flat bottoms. The drainage is generally from the southern crest northwards, all the streams combining at the north angle in one, which is called the Rod, and finds its way by a circuitous course into the Kadanai River. The western corner of Tabin drains to the south into the Pishin Valley.

Toba does not possess so much open country as Tabin. Its western end, known as "Mandan," is the most level portion of the whole plateau, but it is only about five miles wide, north and south, and does not extend more than nine miles eastwards, after which the country becomes hilly, with narrow valleys and only occasional patches of open plain. One of the latter, called Chagi, lies at the extreme eastern point of our reconnaissance, at a distance of about 50 miles from the western end of Tabin.

The drainage of the whole of Toba is northwards to the Kadanai River. Beyond Chagi there is said to be a plain called Tas, with drainage flowing by the Zhob Valley to the Indus.

At the eastern end of Toba, but separated from it by a valley, is the fine mountain called Kand, with a height of 11,000 feet. This appears on the old maps as "Joba Peak"—a mistake probably for Toba Peak.

The general elevation of Toba may be put at about 7800 feet. Tabin is somewhat lower, or about 7200 feet.

Tabin and the western part of Toba belong to the Atchakzai Pathans, while the eastern portion of Toba is the property of the Kakar tribes. There is a fairly recognised boundary, but quarrels about land are said to be frequent, leading to the deaths of several men yearly.

The Atchakzais are migratory, always resorting to the plain country in the winter, whereas the Kakars to a certain extent reside permanently on Toba, and for this reason pride themselves on being a hardier race than their neighbours.

As may be imagined, the winter climate of the plateau is very severe indeed, whence, I believe, the name Toba, an Arabic word meaning "repentance." When asked why it is so called, the people say, "Because it is so dreary and cold and the life is so hard up there!" For Tabin the reason given is that, "it is milder and the life is easier than on Toba," but I cannot find that the word Tabin has any meaning.

The plain ground everywhere is perfectly bare of trees and bushes, but on the sides of the hills and in the ravines there are trees of two kinds in considerable numbers, viz. the "obasht," believed to be the juniper cedar (*Zyzyphus jujuba*), and the "wanná," which is very similar to the mountain ash. These both grow in a stunted manner, as if cut down by the climate; the former is always extremely twisted and contorted, and the latter regularly pollarded. The obasht is nearly useless as timber, but excellent for firewood. The wanná gives a hard, tough wood. Its berries are also much eaten when ripe. Several kinds of bushes grow abundantly on the hill-sides, one of which is very similar to the English gorse.

The whole country is covered with "southernwood" or "wild thyme," which abounds everywhere in Afghanistan, and affords good food for camels, &c. Intermixed with this are various grasses and grass-like plants, of which all animals are very fond, so that the grazing qualities of the plateau are excellent. The table-land is generally well watered, though the natives say that it dries up so much in the summer that they have difficulty in watering their flocks. Wherever the ground admits of it, cultivation is carried on by irrigation, great pains, and some ingenuity, being bestowed on the distribution of the water. The chief crop is wheat—of the bearded variety; barley is grown to a much less extent, and Indian corn occasionally. Wheat is also grown on the slopes without irrigation.

The Atchakzais are not only industrious husbandmen, but possess large flocks of camels, sheep, and goats. The yearly routine of their lives is somewhat as follows. Early in spring the men leave their families in the plains, and go up to Toba—or Tabin—to prepare the dry lands for cropping, and the families, with all the flocks, follow towards the end of April. The harvest is reaped about the end of July, and the corn is at once threshed out by bullocks driven in a circle round a post. The men then proceed to plough the irrigated land for the next crop, which is sown before the great cold of winter comes on, when there is a general exodus to the plains. The ploughing is done by bullocks, and occasionally by camels. The plough is very similar to that used in India, but the wooden share is longer and is tipped with iron, so the ploughing is deeper.

Harrowing is done by dragging bushes over the ground. The women do not work in the fields, except perhaps at harvest time; they grind flour in hand-mills as required for use, but the bulk of the grain is taken down the valleys to be ground by the water-mills, which are common there but do not exist on Toba. The women also make butter in the following way. The milk is put in skins, hung on tripods close to a fire, and oscillated to and fro by hand. The butter is kept for use in the shape of "ghi," and sometimes sold for export in that shape.

I was surprised to find wheat growing, and giving excellent crops, on irrigated land, where subject to such severity of climate in winter, but this is due probably to the deep fall of snow which protects the young plant. From the same cause beautiful, short, green English grass is found in low and damp places, where the snow would drift and lie deep and long.

The table-land is dotted all over with huts admirably adapted to the climate. They are built on the side of a steep hill, with an entrance passage leading down to the body of the dwelling, which is consequently half-excavated below the surface. The walls are of mud, supported and strengthened by wooden posts, and the roof is also thickly covered with earth.

During wintry weather these huts shelter both men and animals, only the camels being left outside, and they are protected against the cold by clothing. In summer the huts are deserted, and the people live in their black blanket tents, made of goat's hair, wandering about the hills with their flocks. The goat's hair is used for these blankets, or mats, which are very strong and durable. The sheep's wool is chiefly sold for export. Camel's hair is not regularly shorn, but sometimes used for blankets for bedding. Sheep's skins are worn with the hair on, as coats called "poshtins"; these are very warm and comfortable, and are worn with the hair inside, except when it rains, when they are reversed.

The sheep are of the kind called "dumbas" (from *dum* = tail) because of their enormous tails, which are nearly as wide as the whole body.

Wild animal life on Toba is very scarce, and we only saw specimens of the following. A small kind of hare, a few "sisi" and "chikor" (both varieties of partridge),* sand grouse, and pigeons. Small birds—excepting a kind of lark—are very rare. The cuckoo was constantly heard. Lizards and land tortoise abounded, and two kinds of snakes were seen, one of which was killed and proved to be harmless. A scorpion was also killed. Fish abounded in some of the streams, of at least two kinds, one of which, a long thin fish, not unlike a white trout in markings, proved very good eating.

The approaches to the table-land from the plains are by the beds of mountain streams. These generally afford a fairly good road till near the crest, when there is invariably a very steep pitch, often impracticable for laden animals, and always difficult for camels with loads. Wheeled carriage is of course out of the question, indeed it does not exist in the country, even in the plains.

The climate of the plateau in summer is very pleasant. The days are of course hot out of doors; though the air is cool and bracing, the mornings and evenings and nights are charmingly cool. In future years Toba will doubtless become a sanatorium for the troops in garrison in Pishin, and very good sites for the purpose are obtainable.

GEOGRAPHICAL NOTES.

Death of Captain Carter and Mr. Cadenhead of the Belgian International Expedition.—The details which have come to hand respecting this most unfortunate occurrence are very discouraging to those who had looked forward to a continuance of the improved communication established some eight years ago between Zanzibar and Lake Tanganyika. The two travellers, on their way back to the coast from the lake, fell in an encounter with the armed bands of Mirambo and Simba, two powerful chiefs of the interior, who it appears had joined forces in order to make war, for some object not clearly defined, in the neighbourhood of the road between Unyanyembe and the station recently founded by the International Expedition on the south-eastern shores of Tanganyika. The locality of the encounter was a village called Mpimbore, situated ten days' journey from the northern end of Lake Hikwa in an easterly direction. Mr. Thomson, the leader of our East African Expedition, had passed through the same district in May last (some six weeks before the disaster), and from what he had observed of the state of the country and the character of Simba, had been induced to write to Captain Carter, strongly advising him not to take that route; but his advice unfortunately was not followed. The slaughter of the two travellers appears from all accounts not to have been premeditated; least of all is the friendly and sagacious Mirambo suspected of having a hand in it. But its effect must naturally be to excite the passions of the natives, and to place for some time to come great obstacles in the way of all travellers. The following is the account of the occurrence given by a correspondent of the 'Times,' as gathered in Zanzibar from the report of two natives who had escaped to the coast:—"On the approach of the war party to the village where Carter and Cadenhead were, the natives all fled, leaving the two Englishmen with their escort of 150 men armed with good guns. Mirambo himself was not present, but a day's journey off. Had he been there, it is judged improbable that he would have allowed white men, with whom he had no quarrel, to be killed. Carter went out to meet the war party with his people and baggage, and while attempting to talk to them and to explain that there was no cause for quarrel between them, a shot was fired, which unfortunately killed Cadenhead on the spot, whereupon the cowardly 150 followers threw down their arms and fled, leaving Carter with only a handful of men, among them his old servant Mahomed, who had been with him for years in the Persian Gulf, and who had come to join him on this expedition, and one of Dr. Kirk's servants, who had volunteered to go with him—fine fellows both of them, and both fell by the side of their master. On seeing Cadenhead fall and the men bolt, Captain Carter, it would seem, judging that the case was desperate, took up his repeating rifle and exclaimed, 'I had no quarrel with you, but now that you have killed my friend I will avenge him.' He fired and killed fifteen. Then seizing Cadenhead's rifle, he killed fifteen more. The last that the two fugitives saw was Carter struck from behind."—It is hoped that no serious consequences to the numerous Europeans now travelling in the interior or stationed on or near Lake Tanganyika may follow this untoward event. With regard to the London Missionary party, the more confidence is felt as they have hitherto been on very friendly terms with Mirambo, who invited them to make his capital one of their stations, and on the eve of his setting out on this last expedition offered to entrust his place to the chief of the mission, Dr. Southron, during his absence. The Sultan of Zanzibar, however, was taking decisive steps to assert his authority in the interior and check these outrages on travellers. Lieutenant Matthews was preparing, when the mail left, to start with a large body of troops for Mpwapwa, where he is to form a military station, and this, it was hoped, would be the stepping-stone to further operations leading to his being able to occupy and make safe for travellers those countries where they are now subject to unfriendly treatment.

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* Sisi = *A. Bonhami*; chikor = *C. Chukor*; sand grouse = *P. arenarius*.

Captain T. L. Phipson-Wybrants' Expedition to Umzila's Country in South-Eastern Africa.—By last mail we learn that the well-equipped expedition for the exploration of the interesting region of South-

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in Pishin, and n South-West Africa,* has forwarded to 'Les
the record of his journeys, from which some
ay be gathered regarding the little-known region
He states that the term Ovampo, usually applied by
the tribes inhabiting a certain portion of the country

Death River Cunene, is entirely unknown to the natives, among
nations generic name is in use. They call each tribe by its own
this ual name, and only the Hereros employ the expressions Ovambo
had Ambo to distinguish certain tribes. With regard to the limits of
est country, it has been usual to confine them to the eleven tribes living
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* See *ante*, p. 586.

Eastern Africa lying inland from Sofala, under Captain Phipson-Wybrants, had completed its arrangements at Zanzibar on the 24th of August, and was about to sail thence for Sofala. The leader had been fortunate enough to engage the services of Chuma and fifty of his best men, on their return from Tanganyika with Mr. Thomson.

French Surveying Expedition for West Africa.—The French Minister of Marine has applied to the War Office for the services of a superior officer and three captains to organise survey parties to carry out the work necessitated by the proposed establishment of three new posts beyond Medina, Senegal, and for the selection of a route for a railway between Medina and the Niger. It will be the duty of these survey parties to make a complete reconnaissance, and, if possible, a general triangulation of the country between Medina and Bafulabé on the Senegal, and between Bamaku and Dina on the Niger; and it will be their especial function to determine the geographical positions and altitudes of the mountains, hills, plateaux, &c., as well as the configuration and extent of the valleys. The work will probably not be finished before the end of next April, though the chiefs of the several parties are to be assisted by officers of the Marines.

Ovampo-land.—Père Duparquet, who has for some time been engaged in missionary exploration in South-West Africa,[*] has forwarded to 'Les Missions Catholiques' the record of his journeys, from which some useful information may be gathered regarding the little-known region of Ovampo-land. He states that the term Ovampo, usually applied by Europeans to the tribes inhabiting a certain portion of the country south of the River Cunene, is entirely unknown to the natives, among whom no generic name is in use. They call each tribe by its own individual name, and only the Hereros employ the expressions Ovambo and Ambo to distinguish certain tribes. With regard to the limits of the country, it has been usual to confine them to the eleven tribes living in the region above referred to, between 15° S. lat. and the Kaoko Mountains, but Père Duparquet does not see why they should not be extended to those on the left bank of the Okavango as far as Libebé, as they clearly belong to the same race, speak a similar dialect, have the same customs, and are considered by the Hereros as forming part of the Ovampo race. He thinks that, since the term Ovampo has been adopted, it ought to be applied not only to the tribes inhabiting the left bank of the Okavango, but to those on the right bank of the Cunene, which has lately been explored. All these tribes are separated from one another by uninhabited tracts of forest-land, and they are always at war with and pillaging one another.—With regard to the dialects spoken in the country, there is more or less difference between them, but they all form part of the same language, which has a great affinity to that of the Damaras, and the natives of the two countries readily understand one another. These dialects, moreover, bear a considerable resemblance to the Congo language. The following are the eleven principal tribes usually termed Ovampos: (1) The Ondonga, also called Ovampo by the Hereros, is the first met with on the south, and they were visited by Mr. Galton. The population numbers about 15,000, this tribe being the most powerful in the region next to the Quanhama. (2) The Oquambi inhabit a district to the north-west of Ondonga, and their numbers are variously estimated at from 5000 to 10,000. (3) The Ongangera live to the west of the Oquambi, and are about 10,000 in number, but of late years they have lost much of their importance, owing to their having been worsted by a neighbouring tribe. In addition to the cereals grown by the other tribes, the Ongangeras cultivate the *Voundzia subterranea*, which grows underground. (4) The Oqualudi, called by the Portuguese Qualudé, and by English traders Okaruthie, dwell to the north-west of the last-named, and are not more than 6000 in number. This tribe is ruled over by Chykongo, and is the most westerly of all. They live but a short distance from the Kaoko Mountains, where some of the Trek-Boers recently settled. (5 and 6) The Great and Little Ombandja are situated on the two banks of an *omaramba*, not far from the Cunene, almost opposite Humbé, and to the north of the Oquambi. The joint population amounts to perhaps 15,000. (7 and 8) Between the Oquambi, Ongangera, and Ombandja dwell two tribes named Ombalandu, of which the one to the south is named Orim of Komutwé (men of trees), and is so called from the men climbing up into trees to defend themselves in time of war. This tribe has recently adopted a republican form of government, in consequence of the despotic rule of their last king. The two Ombalandu tribes are very poor; they are often attacked by their neighbours, but defend themselves valiantly, and have hitherto succeeded in preserving their independence. (9) The Quanhama, or Oquanyama, is the largest and most powerful of the Ovampo tribes. They extend to the east of the Ombandja as far as the River Okavango; but the tract near the river is only inhabited by Bushmen, or used for pasturage. This tribe numbers some 60,000, and the soil of their country is so wonderfully fertile that it might easily support a much more numerous population, a small portion only being at present under cultivation. (10) The Okafina or Cafina is a very small tribe of about 1500 persons, living to the north-east of the last mentioned, and to protect themselves against their attacks they live in a kind of fortress. (11) The Hali, Evalé, Avare, or Var, as the Portuguese call them, is the most northern of the Ovampo tribes, and numbers about 2500. Up to the present time the English traders have not got beyond this tribe with their waggons, at least in this direction, for in 1878 a Mr. Harrison ascended the River Okavango beyond 15° S. lat.—To make the enumeration quite complete, Père Duparquet says we ought to add the Handa, a very small tribe to the north-east of the Okafina, as well as the different tribes on the left bank of the Okavango, and the smaller ones on the south bank of the Cunene, of which hardly anything is yet known. A great number of Bushmen live in Ovampo-land, who are called Okwangalas by the natives, and Mucuancallas by the Portuguese. With regard to the Nhembas, placed on Petermann's map on Portuguese authority, Père Duparquet could hear nothing whatever of them; the tribe is entirely unknown both to natives and hunters who constantly traverse the country where they are supposed to live, and their name should therefore, in his opinion, be omitted from future maps.

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[*] See *ante*, p. 586.

An Egyptian Exploring Expedition in Somali-land.—The 'Bulletin' of the Cairo Geographical Society, which has just been published, contains an account by Lieut.-Colonel Mohamed Moktar-Bey of a reconnaissance of the country of the Gadibursis, or Gudabirsis, a Somali tribe, situated to the S.S.W. of Zeyla, on the Red Sea. After travelling over level ground from Zeyla to Bia-Ramadu, a distance of 65 miles, the expedition reached a forest of gum-trees, some seven miles in extent, and passing Garboâ, 12 miles further on, came to Darinwadu, 90 miles from Zeyla. The country now began to rise gradually, becoming so mountainous that the road beyond Darinwadu, which follows the bed of a ravine, commences at an elevation of 600 feet. The ravine was surrounded by greyish rocks, and extended for many miles southwards. Lieut-Colonel Moktar-Bey mentions that there are a number of similar ravines in the country, which form natural reservoirs for rain-water, and are of great use, as the wells, which are often several hours' march apart, are insufficient for the wants of the inhabitants. Beyond Hoswene, the country being covered with sand and pebbles is not available for cultivation, but between Zeyla and Bia-Ramadu it is of a much better nature. At Dobo-El-Saghir, 125 miles from Zeyla, a mountainous region was reached, and the expedition was obliged to ascend a mountain which, though the lowest of all, attained an elevation of 3352 feet. Twelve miles from the last station they came to a plain encircled by calcareous mountains, where gum-trees were the chief vegetation, forming in one spot a forest which harboured lions, tigers, and elephants. Between Halimali, the next station, and Abbassah, the country, though still mountainous, was found to be of a much easier character. Fifteen miles from Abbassah are the ruins of the same name, among which is an ancient mosque, built of greyish stone without any apparent trace of wood having been used. The expedition next passed over a mountainous tract, so covered with bushwood as to render passage very difficult for six miles, when they reached a plain seven miles in extent, on the other side of which were the ruins called Ababah, after a sheikh who is buried there. Beyond the ruins is a dense forest of gum-trees and *nabks*, four and a half miles in extent. As, in order to reach

Harawah, the limit of the reconnaissance, it would have taken four days' march, in consequence of the difficulties caused by the nature of the country and the number of the escort, Lieut.-Colonel Moktar-Bey determined to encamp his men, and then in company with one officer and one soldier easily finished his work in one day. This accomplished, the expedition returned to Zeyla by the same route. In the remainder of the paper Moktar-Bey furnishes some particulars regarding the inhabitants of the country, who are probably some 87,000 in number. The men are generally above the middle height and strongly built; their complexion is of a dark copper colour, but their expression is animated in consequence of their very bright eyes. They have large foreheads, woolly hair, and straight noses. The women have a similar complexion and vigorous physique, and are generally handsome; their features possess perfect regularity, and their eyes a brilliancy rarely seen elsewhere; their teeth are of dazzling whiteness, and their lips lack the thickness characteristic of the black race. The people are clean in their habits, washing and painting themselves frequently. Their dress is of primitive simplicity, consisting only of two pieces of white cloth; the men wear sandals, but do not cover the head, whereas the women wear a head-dress, but no shoes; the latter are very fond of bracelets and glass ornaments. The Gadibursis wander about continually in the region lying between Hemal and Darmy, leaving a place as soon as they can no longer find food for their herds and horses; consequently in summer they are mostly found in the south-west, and in the winter in the north-east. They live in wooden huts roofed with mats, which also serve as covering for the camels and their loads; skins, tanned and untanned, form their only furniture. They are very religious, and even fanatical, but this does not prevent their being much given to polygamy. The tribes form a confederation, and have a kind of republican government; consequently no decision can be arrived at on any matter without the presence of all the members of the tribe called together to deliberate, and every proposition is put to the vote and decided by a majority. The Gadibursis are of a calm nature, the very reverse of the Issa Somâlis, their neighbours; but to make up for this, Moktar-Bey says that they are more ambitious, and greater cheats and liars than any people with whom he is acquainted.

M. Regel's Journey in Eastern Turkistan.[*] — M. Regel, a well-known Russian botanist, last year made two journeys of exploration in Eastern Turkistan, which were incidentally referred to by Major Clarke in his paper on Kuldja.[†] In the second of these journeys he started from Kuldja, and on reaching the bifurcation of the Ili River to the eastward he determined to follow the northern branch, the Kash or Kass. This river, which receives several streams from the north, flows through a narrow and difficult valley, separated from the Ili valley round as Amherst. The above represents more than two years' work, and during that period some sectional lines of soundings combined with dredging might be run across the Bay of Bengal as occasion offered. Then would follow the survey of the Gulf of Cambay, an important undertaking which would occupy fully twelve months.—The surveys actually executed during 1878–9 consist of Jyghur, comprising 21 miles of coast and 14 square miles of water closely sounded in sections; Washishti (Dabhol or Anjenwil) River, and Chaul, as well as the coast between Kundari Island and Chaul. By aid of the last survey, the small coasting steamers can enter at any time of the tide with the greatest confidence, whereas formerly the channel and the several dangerous shoals off the entrance were but partially known, and navigation was a risky matter. A further protection has been afforded to mariners by the exhibition of a red light on a stone refuge tower on Chaul Kadu north-east reef. All these surveys were executed by Lieutenant Jarrad, R.N. and party, and tidal observations were regularly taken at each locality. Mr. M. Chapman, late I.N. (who most unfortunately contracted inflammation of the liver, and died before the season closed), conducted a survey of Tuticorin roadstead and harbour, but the rough weather necessitated the abandonment of the work before completion. An examination of the water space eastward of the shingle islets at Paumben was made by the same officer, and revealed the fact that there are great advantages for a northern entrance to the proposed ship canal through Paumben, but that a deep southern entrance cannot be obtained. —The natural history investigations of the season have of necessity been confined to observations of the invertebrates inhabiting the shore line of the northern Konkan in the vicinities of Dabhol, Rewadanda, and Chaul, and of the ornithological fauna found in the adjoining districts. Of the latter, about 900 specimens were collected by Dr. Armstrong, and sent to the Indian Museum at Calcutta.—A large number of charts, notices to mariners, and hydrographic notices were compiled and circulated by the department, as well as a list of lighthouses and lights in British India, a return of wrecks and casualties, and other publications of a similar character. Commander Taylor reports that the demand for the various hydrographic publications of the department has greatly increased, and that means have been taken still further to diffuse a knowledge of the existence of these publications by circulating notices in Urdu, Arabic, Persian, and Bengali, among the shipping agencies in Calcutta, and the various post-offices and shipping masters throughout India, as also to her Majesty's Political Residents at Bushire, Muskat, Cutch, and Rajkote. It may be mentioned, in conclusion, that this useful department has published on the average one new chart a month since its foundation in 1875.

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[*] See map, p. 528.

[†] *Ante*, p. 492, note.

The Persian Gulf.—In the official "Administration Report" for 1878–9 of Lieut.-Col. E. C. Ross, Political Resident in the Persian Gulf, are three papers of interest to geographers. One is a statistical account of the Bahrain Islands, from the pen of Captain E. L. Durand; the second, a memorandum on the topography of Khuzistan or Persian Arabia, by Mr. P. J. C. Robertson; and the third is a carefully compiled synopsis of our existing information regarding the geography of Oman, by Lieut.-Col. S. B. Miles, with a review of authorities from the time of El-Edrisi to that of Disbrowe and Powell in 1865. An important section of the Report is devoted to commercial matters.

Eastern Pêrak.—The last part of the 'Journal' of the Straits Branch of the Royal Asiatic Society contains some account by Mr. W. C. Leech of the country drained by the eastern tributaries of the Pêrak River. The most northern of these is the "Plus" River, which Mr. Deane ascended last year,* and gathered from native report that the valley drained by the stream is very extensive, the soil good, and the mineral resources considerable. A jungle path, with easy gradients, practicable for elephants and horned cattle, passes along it across the watershed of the peninsula into Patâni. South of the Plus comes the Kinta River, separated from the Pêrak by what is known as the Blanja Range, along the eastern base of which some of the richest deposits of tin in the country are found. The Kinta is joined by a large tributary, the Sungei Raya, and in the plain between the two a curious geological formation is met with. The main ranges in Pêrak are granitic, but here peculiar isolated limestone cliffs rise vertically to heights varying from 500 feet to 2000 feet. The peculiar feature of this rock is the high state of crystallisation in which it exists; no fossils have yet been found in it, nor can any marks of stratification be traced. Mr. Leech incidentally notes that this district is full of interest to the naturalist, and that the magnificent butterfly—the *Ornithoptera Brookeana*, formerly supposed to be peculiar to Borneo—is found plentifully in several places. After leaving the Sungei Raya, the next navigable river met with is the Kampar, flowing past the foot of Gunong Bujang Malaka. Starting from Kwala Kâbul on this river, Mr. Leech in March of last year made a journey through the country lying between it and the eastern frontier, in order to acquire information respecting it for the Colonial Government. He travelled in a south-easterly direction to the Chindariong River, through a region covered with primæval forest and inhabited by Sakeis, the aboriginal hill tribes of the country. He next struck the Batang Padang River at Pûlau Tiga, and ascended it to the large village of Tâpa. After examining the country, he travelled again in a south-easterly direction, through the gold-fields, to the Bidor, which is another navigable stream flowing into the Batang Padang, a short distance before it joins the Pêrak at Durian Sĕbatang. From the Bidor it took two days to reach the Songkei, the last important tributary of the Pêrak in this direction. Travelling still to the south-east, Mr. Leech entered the next rain-basin drained by the Bernam and its tributary the "Slim," of which little-known section of the kingdom of Pêrak he gives a general idea in a subsequent paper.

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* *Ante*, p. 438.

Coast of Siam.—In a recent hydrographic notice (No. 18) our Associate, Commander A. D. Taylor, Superintendent of the Marine Survey of India, furnishes some information respecting little-known parts of the coast of Siam. Pakchan River, which separates British territory from Siam, is navigable for a considerable distance, and is about two miles broad at its mouth, with a depth of from 60 to 70 feet between Kok Phi and Victoria Point; it is densely wooded on both sides, and numerous small rivers and creeks fall into it. The chief of these on the British side is the Maliwoon River. A small town of the same name, famous for its tin-mines, is situated amongst high hills about 12 miles from its mouth, and 25 miles from that of the Pakchan. Thalang—commonly known as Junkseylon so far back as 1350, when Thya Utong, King of Siam, laid the foundation of Ajuthia, the old capital—is mentioned as one of the most important provinces of Siam. Between 1796 and 1809 Thalang suffered considerably from the attacks of the Burmese, who in the latter year devastated the island; and it has never since recovered its former prosperity. Thalang appears in early times to have consisted of two islands separated by a tolerably broad channel, where two villages are now found. The land thereabouts is very low, with small isolated patches of slight elevation, still called *koh* (islands) by the inhabitants, and only separated from the sea by the sand-hills which fringe the eastern shore of the island, Junkseylon is rich in tin-mines, which appear to have been worked by Chinese miners for centuries. In 1872 the mines employed nearly 35,000 Chinese, but since then the number has been much diminished owing to a fall in the value of the metal. Mining is carried on in the very primitive fashion customary with the Chinese, the result being that during the dry season all operations are stopped for three months through want of water. The land is fertile, but until very lately agriculture has been much neglected. The island, which extends from N. lat. 8° 9′ to 7° 43′, is about nine miles broad, and is divided into two Rajahships of about equal size; it has a population of about 32,500, composed of Malays, Chinese, and Siamese.

The Chinese Province of Shantung.—In his last Consular Report to the Foreign Office from Chefoo, our Associate, Mr. Chr. T. Gardner, has collected together in a comparatively small compass some useful notes regarding the geography, population, resources, &c., of the Shantung province, illustrating them by a sketch-map, on which are shown the great highways to various parts of China. The province contains about 66,000 square miles, and is divided into twelve departments or by rains and snows, were it not that the hills, which might be covered with moisture-producing trees, are bare and barren; every atom of wood, except in the neighbourhood of temples, and a few orchard trees, being ruthlessly cut for fuel as soon as it grows. Similar neglect and improvidence are observable in all directions in the condition of the rivers, lakes, and natural routes throughout the province.

Amsterdam Island.—During her recent voyage from Simon's Bay to Sydney, H.M.S. *Raleigh* touched at Amsterdam Island on May 27th, by order of the Admiralty, in order to examine its present condition, and ascertain if any shipwrecked crew were there. With some little difficulty, Lieutenants Chas. E. Gissing and J. H. Hay succeeded in landing and climbing the cliffs, from which the land rises gradually to the highest central peak (2760 feet). On the side of the hill were several small extinct craters, and higher up larger ones, which they had not time to visit. They searched the island as far as they could, but saw no signs of any shipwrecked people having been there, but there was every indication of recent and periodical visits from fishermen. Lieutenant Gissing further reports that during their search they could find nothing of the bottle recording the visit of our late Associate, Commodore James Goodenough, on August 30th, 1873, in H.M.S *Pearl*. Owing to the shortness of the time at their disposal they were unable to obtain many specimens of plants, but they found that the island was covered largely with sedge and coarse grass, and the soil was peaty in its nature with abundance of water. Some few ferns were collected of the genus *Polypodium;* the shrubs were of the order *Myrtaceæ*, but few in number, and growing only here and there in the hollows. The cones of the craters are stated to be extremely well marked and perfect, but of small size, continuing in some places in ridges running from the central peak down towards the sea.

Depth of the Caribbean Sea.—A thorough investigation of the Caribbean Sea and Gulf of Mexico, with regard to their depth and the nature of the bottom, similar to that to which the Mediterranean and the Atlantic and Western Pacific have been subjected, is still a desideratum in physical geography. On this depends, amongst other things, a right estimation of the relative antiquity of the West India Islands, and the true nature and derivation of their flora and fauna. A series of soundings recently taken by the United States coast survey steamer *Blake* forms therefore a welcome contribution to our scientific knowledge. The *Blake* ran a line of soundings from Santiago de Cuba to the eastern end of Jamaica, finding the enormous depth of 3000 fathoms at 25 miles south of Cuba, a point which proved to be the eastern end of a deep submarine valley, extending in a westerly direction from between Cuba and Jamaica to the Bay of Honduras. This submarine valley was found to be 700 miles in length, with an average width of 80 miles, and to have a total area of more than 85,000 square miles. Its depth is nowhere less than 2000 fathoms, except at two or three points which are the summits of submarine mountains, and its greatest depth is 3428 fathoms, or 20,568 feet.

International Meteorology.—The International Meteorological Committee, of which our associate, Mr. R. H. Scott, is secretary, held its first meeting at Berne in the second week of August last, under the presidency of Professor H. Wild. Many savants of European reputation took part in the proceedings, among them Professors Buys-Ballot, Mohn, and Massart, Dr. Neumayer and Captain de Brito Capello. In the matter of the international comparison of standard instruments, it was found impracticable to establish a combined scheme in which all the chief European observatories should co-operate, and it was therefore determined to recommend each country to make a careful comparison of its own with those of neighbouring countries. The proposal for changing the time of international simultaneous observations, made by the United States Signal Office, was agreed to after discussion. The International Polar Committee, appointed at the Hamburg Conference,* reported that Count Wilczek and Lieutenant Weyprecht had consented to postpone their expedition to Novaya Zemlya until 1882, in order to allow of more time for the organisation of other expeditions destined to co-operate with them. Among the other subjects which engaged the attention of the meeting were the publication of data relating to rain, &c., telegraphic communication with the Atlantic islands, and suggestions for drawing up and publishing a catalogue of meteorological literature. With regard to the last-named, Dr. Hellmann, of Berlin, stated that he had calculated the cost of preparation of a catalogue of printed books and memoirs at about 550*l.*, and that of printing and publication (1000 copies) at about 750*l.* The further consideration of this subject was referred to Mr. Scott and Dr. Hellmann, with power to act if they found sufficient encouragement.

Geographical Society of Lisbon.—The two separate bodies which had since 1876 directed the reviving geographical enterprise of Portugal have been, by Government decree of the 13th August last, fused into one. This has been accomplished by the abolition of the "Permanent Central Commission of Geography," originally instituted as a sub-department of administration under the Colonial and Naval Minister, and the transfer of its functions, library, archives, &c., to the Geographical Society of Lisbon. With this accession of strength and the concentration of public interest and effort in one institution, we may expect soon to hear of results worthy of the nation which once occupied the foremost place in geographical discovery and exploration. The Council of the Society is at present organised as follows: *President*, Dr. J. V. Barbosa du Bocage.

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* Cf. vol. i. p. 738.

Vice-President, Councillor Antonio Augusto d'Aguiar. *Secretaries*, first, Luciano Cordeiro; second, Rodrigo Affonso Pequito. *Treasurer*, João Henrique Ulrich, jun. *Assistant Members*, Count de Ficalho and Gerardo Augusto Fery.

CORRESPONDENCE.

Trade Route to the Obi and Yenisei viâ the Kara Sea.

COTTINGHAM, *September 2nd*, 1880.

Since Professor (now Baron) Nordenskjöld accomplished the North-East Passage, a great deal has been written upon the subject of "Trade with Siberia" viâ the Kara Sea and Siberian river-systems, and hopes have been frequently expressed that Englishmen may not be behindhand in taking advantage of the new field for commercial enterprise which the sea trade with Siberia offers.

I may lay claim to being the first Englishman who has actually done business with Siberia viâ the sea route. In 1878 I was resident and carrying on the business of an export merchant in St. Petersburg (where I was born, and in which city I have passed the greater portion of my life), and obtained leave from the Russian Government to import various merchandise into Siberia by sea, viâ the Kara Sea and River Obi, duty free. I accordingly proceeded to England, and there chartered the *Warkworth*, an iron steamer of about 506 tons register. I purchased various goods in England, such as salt, olive oil, crockery, cutlery, chains and anchors, &c., with which I loaded the steamer at Liverpool, and with which she sailed on the 1st August for the mouth of a small river called the Nyda, in the Obi Gulf. To assist Captain Sheriff in what I then thought was perilous and difficult navigation, I secured the services of Captain Wiggins (who, as you are aware, had been out in those seas before), who went out in the *Warkworth* in the capacity of pilot; and a Russian gentleman, a clerk out of my office, went out also as supercargo. In the meantime I had purchased from a merchant in Tobolsk a full cargo to load the *Warkworth* home with, consisting chiefly of wheat, but in part also of linseed, linseed cake, flax and hemp, and isinglass, all of which goods were to be carried down by barges to the appointed transhipment station at the mouth of the River Nyda.

The *Warkworth* made her voyage to the mouth of the River Nyda, or rather to Cape Linsita, in the Gulf of Obi, without difficulty and *without encountering* any *ice* whatever, arriving there on the 23rd of August. There she discharged her imports into lighters, and loaded her homeward cargo, with which she sailed from Linsita on the 4th of September. My supercargo meanwhile accompanied the imports to Tobolsk, travelling on board of the tug steamer in attendance upon the barges.

On her passage home the *Warkworth* unfortunately met with disasters. First, in the Gulf of Obi, she grounded upon a sandbank (there are no rocks in the Gulf), and had to jettison cargo before she floated again; and next, while steaming in a fog to make the entrance into the Yougorski (Jugor) Straits, she struck upon a rock and broke her stern post and rudder, and cargo had again to be jettisoned before she would float clear of the rock. This rock was, however, not in the channel, but close by the land. As soon after the last disaster as the steering gear could be got into working order, the steamer proceeded on her homeward voyage, passing down through the Fiords as far as Bergen, and reached London without further misadventure on the 1st of October, with the remaining half of her cargo in perfect condition. The voyage was thus made in seventy-two days, and would have been made in a far shorter time had it not been for the disasters. At the same time, during the whole of that period not a scrap of ice impeded the vessel's course, and only a little land ice was seen.

Owing to a sad occurrence, the death of my supercargo, soon after his arrival at Tobolsk, I was obliged to hasten out overland to that town in October. Both my journey to, and three weeks' residence in Tobolsk have left a very pleasing impression upon my mind, both as to the people and the country of Siberia. No one who has not seen it can form a true estimate of the natural resources of wealth of that country. I have visited only a very small portion of the country, but from what I have seen, no eulogies which travellers have passed upon Siberia, as being a magnificent country, are exaggerated.

In 1879 (last year), under the auspices of commercial friends of mine in England, a small company of Siberian merchants got up a trading expedition to the Gulf of Obi upon a larger scale than my adventure of the previous year, and this time I went out personally in charge of the expedition, which consisted of four British steamers:—the *Amy*, Captain Hardcastle; the *Brighton*, Captain Gibb; the *Mizpah*, Captain Baker; and the *R. L. Alston*, Captain Manson. I sailed on board of the *Amy*, which was the first to start on the voyage. The *Amy*, *Brighton*, and *Alston* each carried about 300 tons of cargo outward, and the *Mizpah* went out in ballast. Our destination was again the mouth of the River Nyda, where barges with wheat sufficient for full cargoes for all four steamers were to await our arrival. Besides our fleet there were several foreign vessels engaged in the Siberian trade that year, viz.: the *Louise* steamship, destination the Yenisei River; the *Neptun* steamship, destination Nyda, in the Obi Gulf (both of which had also been out in 1878, and had accomplished their voyages successfully); lastly, the Swedish barque *Express*, and a small Swedish screw steamer, built for the canal trade, the *Samuel Owen*, sent out to tow and attend upon the *Express*.

To give you a detailed account of this expedition would be a long story. I shall be glad to furnish you with it, if of interest, on a future occasion; suffice it now to say that, to the deep mortification of all concerned, the expedition proved a failure. The *Amy* sailed from the Tyne on the 19th July, and after merely calling at Vardoe, to receive and post letters, we reached Waigatch Island, and anchored in the midst of the Yougorski Straits, with ice visible through a light fog, ahead of us, on the 1st August, having made a quick and perfectly easy passage so far, only troubled with perpetual north-east winds. We anchored at night (of course in broad daylight), and early next morning I started off in our lifeboat up the Straits, to reach a headland, off which I hoped to get a view of the Kara Sea, to enable me to judge of the state of the ice, and of our prospects for getting on. A strong adverse tide prevented our reaching our goal before late in the afternoon. When we did, I saw that progress at once was out of the question. Meanwhile, the tide and a freshening north-east wind had brought masses of ice down, and the *Amy* had been forced to leave her anchorage and put back to sea to keep clear of the ice. So that, much to our dismay, we in the boat, on returning to the anchorage, found all traces of our floating home vanished, and all the provisions we had to depend upon were the birds we had been fortunate enough to shoot during the day. These we cooked, and devoured with relish, at the foot of a Samoyede altar on shore, which altar also fortunately supplied us with just enough fuel for our culinary requirements. All night we had work enough to shove our way through the ice to the opposite shore, to get to the village of Nicholsk, where next morning we met with a hearty welcome, and were most hospitably treated by a small party of Russians from the Petchora River (Poustozersk), who come here annually to trade with the Samoyedes on these coasts. Early in the morning of the following day we again took to our boat, the ice being more open, and after eight hours' hard work got to clearer water, and were picked up by Captain Hardcastle, who had ventured as near the Straits as he dared in search of us. Meantime, we found that the *Louise* and *Mizpah* had joined the *Amy*, and a few days afterwards all the other vessels bound for Siberia, except the *R. L. Alston*, had joined us. The latter steamer, we afterwards learnt, had steered a wrong course and had sustained damage near the mouth of the Petchora River.

For days we all lay at anchor near the mouth of the Straits waiting for the ice to pass, as we hoped it would, and enable us to make our passage, and we had frequently to change our anchorages with the changes in the course of the ice. Several times we tried to steam through the ice, and force our way, but all to no purpose. At length we got tired of waiting, and all steamed north to try the Irongates Straits. Here a passage was equally hopeless, and we returned to the Yougorski Straits. After prolonged and repeated but fruitless attempts here to force a passage, we again returned to the Irongates, and finding a passage still impracticable there, we next determined to try the Matoshkin Straits. We entered the Straits at noon on the 24th August, finding all clear, and with joy we thought at last we should get through, and went along full speed in a beautiful waterway, the *Mizpah* leading, the *Amy* second, when all at once, about 10 miles up the Straits, the *Mizpah* grounded on a shoal in mid-channel, and before we could get way astern the *Amy* followed suit. The *Amy* came off in about half an hour, but the *Mizpah* was hard and fast until 1 the next morning, when at top high water she floated. The fleet had meanwhile anchored, the water about this point being shoal enough to admit of anchoring. In general, the Matoshkin Straits are too deep to anchor in, except at certain points, 70 fathoms being a not uncommon depth, even within a few yards of the shore. The scenery is magnificent, mountains rising sheer from the waters on either side to heights ranging from one to three and even four thousand feet! Proceeding early on the morning of the 25th, we shortly came again upon ice, which proved impassable, the fields being large, and the channel very narrow. There being no anchorage, and the strong tide bringing heavy masses of ice down upon us, we had to retrace our steps towards the entrance to the Straits and wait. Meanwhile, already on the 24th the wind had again got round more to north, W.N.W. prevailing, and this soon filled the Straits with ice, which we had constantly to keep dodging. While waiting about the west end of the Straits we watered the ships from a large fresh pool close to the mouth of the Tchirakina River (then almost dry). Close to this we found the remains of the log hut in which Pachtusoff passed the winter of 1834–5, and a few hundred yards to the S.W. of this we erected a landmark, consisting of a 30-feet ricker, with a triangle fixed near its top, and a small box nailed on to it within hand reach, containing a bottle with a parchment in it, on which we inscribed the names of the British steamers, their commanders, and some of those on board, my own amongst others. The ricker is stayed with wire rope, and banked up with stones, so may live out some years.

After several fruitless excursions up the Straits, at length, on the 3rd September, we found an almost clear course, and were enabled to penetrate some fifteen miles into the Kara Sea, when again heavy packed ice arrested our further progress. We followed the face of the ice both to north and to south, but to our deep mortification it led us round to the shore in either direction without one break. It looked thoroughly hopeless, and we were forced to turn back again to safe quarters. On the night of the 3rd of September we met the captains of the other vessels, and it was agreed that things looked hopeless. Coals were running short, the *Express* had already some days before sailed back to Europe, and all the captains decided it was time to abandon the voyage: Captain Dahlman, pilot on board of the *Louise*, alone determining to give the Yougorski Straits one last trial, and he was favoured by circumstances. We had from the date of our arrival up to the 4th of September experienced nothing but north and north-easterly winds, which kept the ice blocked up against the east coast of Novaya Zemlya and Waigatch Island. We sailed homeward on the 4th of September, and on the 6th were met by a westerly gale, but too late to serve us. The *Louise*, however, was by this same change of wind enabled, though with difficulty, to make her voyage. I subsequently learnt that she fell in with two schooners (built by Mr. Trapeznikoff, at Tiumen) trying to make their way to Europe, in which, however, they did not succeed. They were caught in the ice in the Baidaratsk Gulf, and were abandoned there by their crews.

Circumstances have prevented my making a fresh attempt at working the Siberian trade this year, not want of will, or want of faith in the entire possibility of making the voyage. Last year was an exceptional season, of that I am convinced; and I am equally convinced that the *Neptun* and the *Louise*, both of which have gone out again this year to the Obi and Yenisei respectively, as also the *Samuel Owen* steamer, with Mr. Sibiriakoff on board, and two sailing vessels chartered by that gentleman, will accomplish their voyages successfully, at least in so far that it will not be *ice* which will stand in their way.*

I must here express my deep regret at seeing such utter want of enterprise, as concerns the Siberian trade *viâ* the sea route, amongst my fellow-countrymen. It will be a case of "first come best served" in the Siberian trade, and the foreigners are aware of this and are quietly and surely getting into the trade, and will be able to work it in another year or two as certainly as the Archangel trade.

In the *Golos* newspaper which I have received to-day, dated the (16) 28th of August, I see an article with reference to Novaya Zemlya. Captain Tiagin, who wintered on the island (near Moller Bay) in 1878–9, went out there in the beginning of July of this year to inspect his small colony, and to arrange for making a permanent salvage station on the island.

I would close my letter by observing that it is a mistake to look at Siberian trading expeditions in the same light as Polar expeditions, as is frequently the case. The Yougorski Strait is the natural highway into the Kara Sea. There one may be sure of meeting hospitable human beings every year from the 1st of June (n. s.) to the end of October or even November. Water and food are there to be had in abundance. Once the Yougorski Straits are reached the remainder of the voyage to the Obi or Yenisei is mostly a matter of coasting, and in case of disaster land is within near reach. Friendly Samoyedes are to be met with in the Baidaratsk Gulf, and over the greater part of the Yalmal Peninsula. The Russian Government have, moreover, now established a small colony on the west coast of Novaya Zemlya, as above mentioned, in Moller Bay as a permanent salvage station. There is no risk to life on a Siberian expedition.

OSWD. J. CATTLEY.

To the Secretary of the Royal Geographical Society.

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* On the eve of going to press (September 25), we learn from Mr. Cattley that he has just heard by telegram from Vardö of the arrival, on the 24th, of the *Neptun* from the Obi with a full cargo of wheat.

We take this opportunity of announcing that Mr. C. R. Markham has just received the following important telegram from Mr. Leigh Smith:—"Hammerfest, September 25, 4 P.M. Reached Franz-Josef Land, August 14th. Explored land to the west as far as 45° E. and 80° 20′ N., and sighted land from that point about 40 miles northwest."

This is extremely satisfactory, quite confirming Captain Markham's view that, with a good steamer, a very advanced position might be reached in that direction, and that it is the best route for future polar exploration.

PROCEEDINGS OF THE GEOGRAPHICAL SECTION OF THE BRITISH ASSOCIATION, SWANSEA MEETING.

Thursday, August 26th, 1880.

After the delivery of his Address (*ante*, September number, p. 574), the PRESIDENT, General Sir J. H. Lefroy, took leave of the Section, on account of being called to assume, at short notice, the administration of Tasmania. The chair was then taken by Lieut.-Gen. Sir H. L. Thuillier, R.A., Vice-President.

The following paper was then read:—

Through Siberia, viâ the Amur and the Ussuri. By the Rev. HENRY LANSDELL.—The author's journey was undertaken with the object of visiting prisons, hospitals, and charitable institutions in Siberia, which were found to be in a much better condition than is generally supposed. He travelled from the Ural to the Pacific by a route not usually followed: namely, from Ekaterineburg to Tobolsk on horseback; thence by steamer on the Irtish and Obi to Tomsk; again by horses to Barnaul, Irkutsk, Kiakhta (steaming across Lake Baikal), across the Trans-Baikal province to the Shilka; then by steamer to the Amur, down its entire length to Nikolaiefsk; and subsequently returning southwards, by the Ussuri, Sungacha, and Suifun to Vladivostock. On reaching the Obi, on the 62nd parallel, the author found on June 8th comparative winter, or leafless spring; the thermometer falling at night to 35°, but rising to 75° Fahr. by 9 A.M. Fine weather set in a week afterwards and continued throughout the journey. Here the Ostjaks offered live ducks for five farthings each, large fish called *yass* for 1½*d.* a pair, and pike for a farthing each. Milk cost 2½*d.* a bottle, but young calves in remote villages could be purchased for sixpence each. The belt of rich black earth in the region immediately north of the Altai lets for 3½*d.* per acre, and from it wheat may be purchased for about one-twentieth its cost in England. Still further north, in the forest region, rich in excellent timber and fur-bearing animals, meat was bought up wholesale in 1877 at less than a halfpenny per English pound; whilst in the most northerly region, that of the *tundras*, the rivers are so full of fish that one of the ordinary difficulties of the natives is to avoid breaking their nets with the weight of the draught. The fish are frozen and sent more than 2000 miles, to St. Petersburg, where a very moderate price realises for the fisherman a profit of nearly a hundred per cent. The author mentioned these prices for the information of those who are interested in the proposed trade between Siberia and England by the rivers Obi and Yenisei *viâ* the Kara Sea. He reached Tomsk on the 10th June, having accomplished a journey of 5200 miles in twenty-six travelling days; and then made a detour of 600 miles to Barnaul, through a singularly rich and productive country. Irkutsk was reached, after a posting journey of 1040 miles, on the 6th July. After crossing Lake Baikal, and making a detour to the Chinese frontier at Kiakhta, the hilly steppes of the Trans-Baikal province were crossed through Chita and Nertchinsk to Stretinsk. In the neighbourhood of Nertchinsk are the mines in which prisoners are popularly supposed to be killed by inches, living amid quicksilver fumes. Inquiry into this matter failed to convince the author that there is a quicksilver mine in Siberia, and when he inquired of released prisoners who had worked in the mines concerning such alleged enormities as keeping them underground entirely, they distinctly denied the truth of such charges. The author himself visited the convict gold-mines at Kara, 70 miles down the Shilka from Stretinsk. Kara is a penal colony with upwards of 2000 convicts (including a few for political offences), condemned to hard labour in the gold-mines. The labour is done on the surface, and consists in digging earth and carting it away to be washed. The hours of convict labour, however, are shorter than those of free labourers in the same mines; and in the winter, the ground being frozen, the prisoners have little or nothing to do. Their weekly allowance of food weighs nearly double that given to English convicts, and after a certain time they are allowed to live with their wives and families before being settled as colonists. The scenery of the Shilka (Mr. Lansdell believed) would compare not unfavourably with the Rhine. After a course of 650 miles it unites with the Argun at Ust Strelka, and forms the Amur. From Ust Strelka to its mouth the Amur has a course of 1780 miles, with a fall of 2000 feet; but if the Argun be regarded as the head-quarters of the river, there must be allowed to the Amur a length of 3066 miles, and a fall of 6000 feet. At Ust Strelka the river is 1100 yards wide, and 10 feet deep. At Albazin, 160 miles lower, it contracts to 500 yards, but the depth increases to 20 feet. It then runs 400 miles to the south-east and passes Blagovestchensk, the left bank from Ust Strelka being Russian, and the right bank Chinese territory. At Aigun the river increases to a mile in width, and at Pashkova commences to flow through the Bureya Mountains in a stream 900 yards wide, and from 110 to 80 feet deep. After this the stream widens up to the confluence of the Ussuri, which flows into the right bank of the Amur at Khabarofka, 1123 miles from Ust Strelka. From Khabarofka, Mr. Lansdell descended the Amur 600 miles to Nikolaiefsk. The river now widened in some places to three miles in a single channel, and where islands intervened its greatest breadth was as much as 12 miles. On the third day from Khabarofka the traveller reached Michailofsk, situated in the district whence is produced the corn of the Lower Amur. On the last day's travel, Mr. Lansdell saw at Tuir some Tatar monuments supposed to be inscribed with Sanscrit words and Chinese, Uigur, and Tibetan characters. It is said to be the site of an ancient Lama monastery. But the characters on the principal stone proved to be Chinese, marked over others, like a palimpsest manuscript. He reached Nikolaiefsk on the 13th, and stayed to the 30th August, then returning to Khabarofka. This gave him ampler opportunity of seeing the natives—especially the Gilyaks and Goldi. The Gilyaks inhabit the lower part of the river, are small in stature, and live almost entirely on fish. They have little notion of a Supreme Being, and are commonly said to worship the bear (this however they denied). So far as they have any religion at all, it is that of Shamanism, common to most of the aborigines of Northern Asia, the chief feature of which appears to be that of a priest performing incantations, and connected with which is the drinking of brandy to intoxication. They use also rough idols of wood. Higher on the Amur and up the Ussuri dwell the Goldi, numbering 6000. They are slightly superior to the Gilyaks, but both people buy their wives, and practise polygamy; a wife costs eight or ten dogs, a sledge, and two cases of brandy. The favourite winter dresses of Goldi and Gilyaks are made of the skins of their dogs, but in summer they use dresses of fish-skin. The Russian Missionary at Khabarofka told Mr. Lansdell that in twenty-three years he had baptised in the neighbourhood more than 2000 heathens. On the 4th September the traveller came the second time to Khabarofka, whence he proceeded up the Ussuri. This river is nearly two miles wide at its junction with the Amur. In ascending, the right bank is Chinese territory, the left Russian. The Chinese bank is for the most part flat, but the horizon is bounded by low mountain peaks. The left, or Russian, bank is mountainous and wooded. Sometimes the mountains retire, leaving a rich bottom land of English park-like scenery. The habitations passed on the Ussuri were few and far between. Most of the Russian dwellings consisted of Cossack *stanitzas* and pickets, placed there to guard the frontier. The Ussuri is navigable several miles below Busse, and could a railway be made from Vladivostock to its most southern navigable point it would be of the greatest importance to the fertile lands of the lower sea-coast province. The total length of the Ussuri is 497 miles. The upper part of the stream is rapid, and below the confluence of the Sungacha also it is swift; but towards the mouth it has a current of two knots only. It presents no special difficulties to navigation. On the 9th September, Mr. Lansdell, at Busse, entered the Sungacha, which is from 110 to 111 feet wide, and from 50 to 80 feet deep. It is very tortuous and winding, having a bend in each half-mile; the water is so muddy as to be unusable for cooking, but is full of fish and also of turtles, and the banks abound with game and also with tigers. On the evening of the second day the traveller arrived at Lake Khanka. There were two Chinese houses, of which not a dozen had been seen all along the Ussuri; thirty-six Russian stations in all were passed. Lake Khanka is 65 miles long, and from 21 to 26 miles wide. Its shores, with the exception of the south and south-east, are wooded, but not mountainous. After steaming across it during the night, and arriving at Kamen-ruibaloff at dawn on September the 11th, Mr. Lansdell had to drive nearly 100 miles in the roughest of conveyances to the River Suifun, through a country singularly fertile, but almost uninhabited. The journey was accomplished by the evening of the second day, and on reaching Rasdoi there was found a small steamer to carry him 30 miles on the Suifun to the Amur Bay, where he was transshipped to a larger steamer, which brought him to Vladivostock—thus finishing his journey from London of 11,555 miles.

Friday, August 27th.

The Highway from the Indus to Candahar. By Sir Richard Temple, Bart.—This was a lecture, in substance the same as that delivered by the author at the meeting of the Royal Geographical Society of June 14th, and published in the September number of the 'Proceedings,' p. 529. Some remarks were, however, added in reference to recent events in the neighbourhood of Candahar; the military movements and the locality of the raid on the railway stores in the Hurnai Valley being pointed out and explained on the maps and pictorial diagrams. Sir Richard expressed his unchanged opinion as to the value and necessity of the projected line of railway.

Six Years' Explorations in New Britain and Neighbouring Islands. By Wilfred Powell.—The author commenced by stating that New Britain was first discovered to be an island, separate from New Guinea, by Dampier, who passed in 1699 through the straits since named after him. Some parts of the coast were afterwards visited and described by D'Urville, who gave the native name of Birara to the island. The neighbouring Duke of York group Mr. Powell had found to consist of fourteen islands (seven larger and seven smaller), and not of one island only, as given in the Admiralty charts. The largest of the group is about five miles long from east to west, and 3½ miles wide in its broadest part from north to south. The mission-station of the Rev. Mr. Brown is situated on an isthmus 200 yards wide, which separates two harbours on the north-eastern side, viz. Port Hunter and Macada Harbour. Farther south lies Mioko Harbour, one of the most sheltered ports in this part of the South Seas. The natives of the Duke of York group appear to be a mixture of the tribes inhabiting the two neighbouring large islands, New Britain and New Ireland. Their language, however, resembles most that of the inhabitants of New Britain. The author devoted much time and pains to surveying and charting the coasts of New Britain, and in the course of his explorations made long journeys into the interior and studied its wonderful volcanic phenomena. Its north-easterly point is Cape Stephens, in 4° 7′ S. lat., and 152° 7′ 45″ E. long., formed by a spur of a volcano called the "North Daughter," 1700 feet in height. On the same peninsula are two other peaks called the "Mother" and "South Daughter," between which lies a volcano which was in violent eruption in May 1878. During the eruption an island of considerable extent was upheaved in one night in the neighbouring Blanche Bay. The author, in landing upon it a week afterwards, found the surface too hot to stand upon, and the water in the crater at its centre was in a boiling condition, throwing up clouds of steam. The eruption of the volcano lasted more than a month, and presented a grand spectacle when viewed at night from a neighbouring elevation. Huge masses of molten pumice-stone were ejected to an enormous height, bursting like rockets into showers of sparks. The surface of the sea in Blanche Bay was so thickly covered with pumice that it was impossible for a vessel to work its way through. The extreme easterly point of New Britain is formed by Gazelle Point. Near this is the Kininigunun district, on the shores of which the author established his residence, making it the starting-point of his inland excursions. Farther along the coast, from Cape Palliser to Tongue Point, the natives proved to be exceedingly hostile, and Mr. Powell's attempt to land was frustrated by showers of stones hurled with great force and precision by means of slings. These slings are formed of an oblong piece of bark, with two strings, about a yard in length, fastened one to each end, with a button of pearl-shell fastened to one of them, to prevent the string slipping through the fingers. A native will discharge with his sling a stone with great force to a distance of 250 yards. Their other arms are spears and clubs. Farther south a beautiful bay was discovered, which Mr. Powell named Henry Reid Bay. It forms a complete harbour, 4½ miles wide, and has richly wooded shores, with two rivers of considerable extent flowing into it. Fortunately the natives here proved more tractable, and friendly relations were entered into with them; but they were found to be cannibals. The author next described the northern coast, from Cape Stephens westward. At Tarlily Bay, a few miles from Cape Stephens, four of the teachers of Mr. Brown's mission were killed and eaten by the natives. Here, and farther to the south-west, the coast-land is thickly peopled, and lined with coco-nut trees. Port Webber is formed by an opening extending six miles inland, the district at its head being called Cambira. In the distance rises Mount Beautemps-Beauprés, 1800 feet high; and other rugged peaks, of somewhat greater elevation, are seen on the western side. Thirteen and a-half miles north-west of Port Webber is Materbert Island, beyond which lies Byning Bay, and farther on Cape Lambert, Open Bay, and Port Powell, a harbour well adapted for the refitting of small vessels. The Ladanseur Island of the charts near here does not exist, the mountain called the "North Son," seen from a distance, having been mistaken for an island. Of the three mountains near here, called the "Father and Sons," two, the "Father" (4000 feet) and "South Son" (3000 feet), are active volcanoes, the former being the most active, and its crater having evidently grown out of an older one. Both cones are well wooded up to the old craters, their new craters being destitute of vegetation. The "North Son" is only 1300 feet high, and appears to be extinct or dormant. The natives of Open Bay showed a friendly disposition to the exploring party. The bay is separated from Spacious Bay by an isthmus of only five miles in width. The author exhibited an admirable chart of New Britain, drawn by himself, and numerous specimens of the ornaments, weapons, and utensils of the natives, the uses of which he explained to the meeting.

Explorations in New Guinea. By the Rev. W. G. Lawes.—A summary of observations made during a three years' residence at Port Moresby, and excursions along the south-eastern coast of New Guinea (*ante*, p. 602).

Monday, August 30th.

Results of the Portuguese Expedition in West Central Africa. By Captain H. Capello and Lieutenant R. Ivens.—This report on the work of the important expedition sent out by the Portuguese Government to Western Africa was read in English, to the Section, by Lieutenant Ivens, Captain Capello being also present. It commenced by referring to the brilliant journey across Africa by Lieutenant Cameron as supplying the chief stimulus to the action of the Portuguese, as it did to other European nations, towards geographical enterprise in the same field. Soon after Cameron's return, early in 1877, on the initiation of the Government and the Geographical Society of Lisbon, an expedition was resolved upon, the chief object of which was to be the exploration of the Quango, one of the great southern tributaries of the Congo. The party, consisting of Major Serpa Pinto and the authors of the present report, was organised in May 1877, and departed from St. Paulo de Loanda at the end of June in the same year. In order to commence at the head waters of the Quango, the party went by sea from Loanda to Benguela, and having completed its *personnel* of native porters, marched by land to Bihé, a remote trading-station on the elevated watershed, where the Zambesi, Çubango, Cunene, and Quanza, as well as the great southern tributaries of the Congo, take their origin. From Benguela the party proceeded by a southern route, touching the 15th parallel of south latitude, penetrating into the mountainous region of Dombé, and entering on the table-land to the east of the Portuguese establishments of Quilengues. They then passed through Caconda and the territories of Nano, as far as the districts of Gallangue and Quingolo, whence they proceeded to the plateau of Bihé, thus making a journey of 400 miles from the coast. Here Major Serpa Pinto left the expedition on his adventurous march to the east coast and Natal. From Bihé, after completing their surveys and observations at this important point, which it is expected will eventually be chosen as a scientific station, MM. Capello and Ivens proceeded to the forest district of Quioco, one of the most interesting regions of Central Africa in a hydrographical point of view; to reach this the expedition had to march 250 miles, and traverse the districts of Luimbe, Quimbandi, Ganguellas, and Songo. The next stage from Quico was Cassange, by way of the Great Songo, Quembo, and other districts, a detour being made, in consequence of difficulties with the Bangolo tribe, towards the Portuguese settlement of Duque de Braganza, on the banks of the Lucalla. During this part of the journey, to beyond Cassange, the expedition followed the River Quango, the survey of which they completed, one of the leaders taking the eastern and the other the western side. From the banks of the Lucalla, striking out again for the Quango, they traversed the dominions of the king of N'Guinga and Matamba, and entered the extensive forest region of Huango, travelling in a northerly direction as far as the 6th parallel of south latitude (the farthest reached). At this point and to the east of the Quango, not far from the river, the expedition entered the dominions of one of the most important chiefs of the African interior, of whom and of whose country nothing was previously known. The name of the chief is Meguiamvo or Quianvo, and that of his country Jaca, which extends as far as the Congo, and is bounded by the domains of the Soba Munene Congo Tubinjé, which lie between Jaca and Lunda. It was found impossible to proceed farther in this direction, partly from the exhaustion of their stores and continued illness, but chiefly on account of the difficult nature of the country, which is studded with small lakes, a great number of which were determined, and which MM. Capello and Ivens have no doubt mark the locality of the hypothetical Aquilundo of the old geographers. The return journey was in a south-westerly direction through the districts of Macume, N'Gimbo, and Dunjé, towards the Upper Quanza, the course of which river they followed down to the sea. The total length of the land journey thus accomplished was 4214 kilometres. As to general configuration, the whole region of West Africa covered by the expedition south of the Equator may be described as consisting of three well-marked areas :—1, a central table-land; 2, a hilly region surrounding it; and 3, a zone of lowland near the coast. Between Benguela and Bihé innumerable streams were crossed, almost all of them having their sources in the elevated central regions and reaching the coast by successive rapid descents between the 9th and the 17th parallels of latitude. Among the most remarkable is the Copororo (the left bank of which was followed by the expedition), the Cunene, and the Cubango (the course of which, by exception, is towards the south-east). All these rivers are extremely tortuous and full of rocks, and their currents being rapid, they seem in general to be little adapted for any kind of navigation. Another peculiarity of the river-systems is the tendency of the innumerable affluents on each side to flood their banks, thus rendering their survey extremely difficult. All take their rise on the northern or southern slopes of the great central ridge which traverses the interior in the latitude of Quioco, south of Bihé, and is prolonged south of Lake Bangweolo under the name of Muchinga, to the plateau of Lobisa. This is the most important elevation of Central Africa south of the Equator, as it forms the dividing point between the basins of the Congo and the Zambesi, in conjunction with another elevated ridge called Mossambé, running north and south, and intersecting it in 12° S. lat., and 18° E. long., on which are the sources of innumerable affluents of the Zambesi and the Congo. On account of this intersection taking place near it, the region of Quioco must be considered as of high interest to the scientific geographer and well deserving of the epithet of "Mother of Waters" in South-west Central Africa. In the space of 1000 square miles around the residence of a chief named Mune Quibau the expedition discovered, at distances not more than 20 miles apart, the sources of five or six of the most important rivers of the continent, viz. the Quango, the Kassai, the Lu-ando, the Chicopa, the Lume, and the Jombo, besides about a hundred smaller streams tributaries of the preceding. The Quango, at first, flows between the two great mountain ranges of Tala-Mogongo (on the west) and Moenga (on the east), forming many cataracts and rapids and receiving many affluents, all of which were surveyed. The most important falls are six in number, the last being situated in 8° S. lat. Many of the affluents were previously unknown. In the 7th parallel of south latitude the mountain range of Tala-Mogongo cuts obliquely another system of sierras, named in the north-west Zombo, which extends to the Congo above the Yellala Falls. The extensive region of small lakes before mentioned is situated on the slopes of this latter mountain range, and the expedition charted various rivers having their origin in the range, as also all the numerous streams of the western slope in the Luamba region. With regard to the natives—all belonging to the great Bantu division of the Ethiopian race—the general observation may be made that the physical, mental, and social development of the very varied tribes improves in the ratio of the altitude of the locality. The greater the altitude of his home the more perfect is the native, and the races of the coast region are the most rachitic, the least intelligent, and the most unfortunate of all. In the industrial arts, it is also remarkable that the tribes farthest in the interior, and therefore most remote from European contact, are the most ingenious. The coast native does not manufacture a knife for his own use, the inhabitant of the plateaus does; the latter even manufactures hoes, and sells them to the degraded coast negro. The difference is enormous between the Ganguella and the Maiaca, the one living at an altitude of 5500 feet in a climate of 64° mean temperature, and the other at an altitude of 1600 feet in a mean temperature of 80°. The political system is very similar in all the tribes. Each has a chief, who at times transmits his power to his successors in a collateral line, while at other times a chief is elected by the people. Polygamy is characteristic of the lowest tribes; fetishism and the most brutal superstition and slavery everywhere prevail. The expedition collected material throughout their journey towards vocabularies of the many native languages. Being furnished with a very complete outfit of scientific instruments, they have been able to bring home an extensive series of observations in magnetism and meteorology, as well as in all appertaining to their special work—the fixing of positions by astronomical and hypsometrical observations, and the geographical survey of the regions traversed.

The authors of the paper were cordially received by the Section, and on the conclusion of the paper the importance of the scientific achievements of the expedition were dwelt upon by the Chairman (General Sir H. Thuillier), Sir Henry Barkly, and Admiral Sir E. Ommanney. Mr. Trelawney Saunders also called attention to the beautiful detailed map in MS. of the country explored which MM. Capello and Ivens brought for exhibition.

Recent Travels in Trans-Jordanic Palestine. By LAURENCE OLIPHANT.—The paper comprised notes of a journey undertaken during the spring of last year through the provinces of Jaulan, Ajlun, and Belka, to the east of Jordan. Crossing the Jordan at its source, Mr. Oliphant struck south-east from Bamai, visiting the new Circassian colony of Kuneitereh. Then crossing the fertile pasture-lands of Jaulan, the ancient Gaulanitis, or Jolan of the Scriptures, he kept along the eastern base of the Jebel Hesh range, ascending Tel-el-Teras, its most southerly peak. Thence in an easterly direction to Sheikh Sa'ad, where the fountain and sacred stone of Job are resorted to, more especially by negro pilgrims from Soudan and other parts of Africa, and form "holy places," much venerated in the neighbourhood. Thence to Tel-Asherah, which the author thinks he has satisfactorily identified as the site of Ashtaroth Karnaim, and thence by way of Mesarib to Irbid (Arbela), and Beit-er-Ras, the ancient Capitolias, at both of which places are interesting remains of architecture of the Greek and Roman type, common to this part of the country in the first and second centuries after Christ, and where the stone houses of the Jefnide and Ghassanide Arabs still remain to testify to their superior civilisation. Both at Tel-Asherah and Irbid, however, the author found the substructure to bear marks of an antiquity anterior to the Christian era. From Capitolias the south bank of the Yarmuk was followed to Gadara, the extensive ruins of which are too well known to need description. Thence in a south-easterly direction into the forest-clad mountains of Gilead and by a circuitous route to Ajlun, the principal village of the province of that name, dominated by the Saracenic castle of Kalat-er-Rubud. Thence easterly to Jerash; thence to Salt, and from Salt in a due easterly direction to the interesting and little known ruins of Yajuz; thence to Kalat Terka, a station on the Hadj road from Damascus to Mecca, and probably the site of the ancient Gadda; thence south-west to Rabboth Ammon and back to Salt. From Salt he also visited the interesting ruin of Arak-el-Emir, the fortress of Hyrcanus. The whole country traversed, was, excepting in its eastern sections, either pasture, wooded, or arable land, and the author believed it to be capable in the highest degree of development; while there could be no doubt that in the unexplored mountainous region traversed by the Upper Yabbok ruins remain yet to be discovered, and sites to be identified, which would contribute for some years to come to make the whole of this country, already so replete with historical associations, a most interesting field of research.

Pictorial Aids to Geographical Teaching. By G. G. BUTLER.—Colonel H. H. Godwin-Austen read this paper which was worded as follows:—In the courses of lectures on Physical Geography instituted in London and the suburbs, by the London

Society for the Extension of University Teaching, a general want has been felt of good illustrative apparatus. In the absence of good existing wall-diagrams, which should be more than mere sections, and should combine pictorial effect with strict truth to nature, and with a view to meet this want, a conference was held on May 7th, 1880, of members of the Society and its teaching staff; the conference consisting of Professors Bonney, Martin Duncan, and Rupert Jones, the Hon. G. Brodrick, Mr. F. Galton, and Mr. G. G. Butler. After several meetings it was finally decided, *inter alia*, that it was desirable "that a series of small sketches, suitable for enlargement into wall-diagrams, illustrating the main features of the chief physical phenomena of the earth's surface, should be designed and published in lithography or otherwise, and that corresponding large-sized diagrams should be prepared therefrom, for lecture purposes." Application having been made to the Council of the Royal Geographical Society, the project was favourably received by them, and a grant of 25*l.* was kindly made towards preliminary experiments. As a result of these experiments (involving an expenditure of about 6*l.*), it has been ascertained that small-sized designs, measuring 6 inches by 4, can be produced at a moderate cost by photolithography from original drawings, published woodcuts, photographs, &c., on a reduced or enlarged scale, according to the size of the original. From any one of these small-sized designs an enlarged fac-simile can be made, by a process involving the use of the camera lucida, to a size of 60 inches by 40, suitable for hanging on the wall of a lecture- or class-room, and capable of being reproduced by lithography in considerable number. If as many as 1000 or 2000 enlarged copies were taken, they could be sold at a rate of about 2*s.* each, unmounted, which would put them within the reach of most schools where geography is taught. If colour were added, there would be about 6*d.* added per copy for each tint employed.

The above-mentioned committee consider that a series of about 50 of the small-sized designs, if printed to the number of 1000 or 2000 in the form of a small album, with a few lines of description to accompany each design, might be distributed gratis not only amongst lecturers on physical geography, but amongst public and private schools, and other educational establishments where geography is taught, and that in this way the possibility of obtaining a corresponding series of wall-diagrams of a large size could be brought before the notice of persons interested in geographical education.

STATEMENT OF COST.

	£	s.	d.
Cost of photolithographing 48 subjects	21	0	0
Cost of printing 1000 copies of the set of 48	14	0	0
" 2000 " "	26	10	0

Total cost for 1000, £35; for 2000, £47 10*s.*

These sums do nor include payment for original drawings or for the use of photographs or woodcuts, nor for the distribution of the album among teachers, which items might amount altogether to 20*l.* or 30*l.*

A list of 34 subjects for diagrams in Physical Geography and the Principles of Geology is submitted as desiderata, and also the following list of wall-maps.

1. Map of the world, showing the general contour of levels of sea and land; and in addition (provided the general effect is not thereby obscured) marking the position of the known volcanoes.
2. Map of the world, showing distribution and direction of winds and ocean currents.
3. Ditto, showing summer and winter isotherms and distribution of rain.
4. Ditto, showing the distribution of plants.
5. Ditto, showing distribution of animals.

These maps should avoid Mercator's projection, and should convey and emphasise the idea of the globular form of the world, so far as it is possible for a flat surface to do so.

Specimens of the kind of illustrations suggested in the above paper were submitted to the Section by Colonel Godwin-Austen, who added that the diagrams would be subjected to critical examination so as to avoid any possibility of exaggeration; especially in the features, so very often found to be the fault in drawings, of mountain scenery. It is desirable, he said, that the first series should not be made too geological. Further pecuniary aid from scientific bodies was required to carry out the entire scheme, and as to the objection that might be urged that such a work might be left to the enterprise of private publishers, he thought that such a selection of drawings as would be made in that way could not possess the value or accuracy of drawings made under the direction of a committee of scientific men conversant with the features to be delineated. Among the large number of masters employed in teaching physical geography, there are very few who have sufficient artistic talent to make their own diagrams for lecture purposes, or who have had opportunities by travel of studying the physical features of distant countries. He insisted, lastly, on the great value of such pictorial illustrations in rendering the subject of physical geography so much more interesting as well as intelligible to young students, the value increasing in proportion to the artistic excellence and accuracy of the drawings.

In the discussion which followed the reading of the paper, Mr. Donald Macalister spoke in testimony of the great value and necessity of good diagrams in teaching physical geography. Mr. T. Saunders maintained that accurate conceptions of the relations of geographical features were more likely to be made by geographers than by geologists, and attributed the failure of the latter to take broad and clear views of the great features of the earth's surface and their relations, to the too great specialisation of their studies. He instanced the case of the Bolor mountain range, connecting the Himalaya with the Tien-Shan, which had been indicated by Humboldt, on the purely geographical method, but had been since denied to exist, by Severtsof, on geological grounds; the more recent surveys proving the geographer to have been right and the geologist wrong. Mr. Saunders, in conclusion, appealed strongly in favour of a renewed demand being made for the institution of professorships of geography at our leading Universities.

Notes on a Journey from Canton to Kwei-yang-fu up the Canton River. By W. MESNY.—In this paper Mr. Mesny, who has passed many years in the interior of China in the service of the Chinese Government, and who accompanied Captain Gill from Ch'êng-tu to Bhamó during his journey across China to Burma, communicated particulars of his voyage up the Hsi-ho or Canton River to Kwei-yang-fu in the province of Kwei-chow, a route not before travelled by any European. He started from Canton on March 9, 1879, in a native junk, ascending the west river past Fu-shan (the Fat-shan of W. & A. K. Johnston's map), and entering the main Hsi-ho (Si-kiang of Johnston) at San-shui-hsien. Here the river is 200 yards wide, and deep enough for steamers of 1000 tons; its banks are fertile and well cultivated. After passing Shoa-shing-fu (Chow-king), the frontier of Kuang-si was reached at Wu-chow-fu (Oo-chow), on the junction of the Fu-ho and Hsi-ho. This city is the centre of a considerable import and export trade, and is visited for commercial purposes by the aboriginal Miao-tze from Kwei-chow, with strange costumes and incomprehensible tongue, who are looked on with contempt by the people of the great central nation. Even now there are here stores for foreign goods which have managed to pass the Lekin or octroi barriers so numerous between Canton and Wu-chow-fu. These barriers afford little benefit to the revenue, being used by greedy officials as a means of extortion; and they cripple trade by increasing the cost of articles in proportion to the distance of carriage. Wu-chow-fu might, however, the author believed, yet become a good treaty port for Kuang-si, Kwei-chow, and some parts of Hu-nan and Yün-nan, as light-draught steamers for towing purposes could come up with cargoes all the year round. After a journey of twenty-one days up the Fu-ho (Kwei-fong or Cassia), the traveller reached Kwei-lin-fu (Kuei-ling), the provincial capital of Kuang-si, on June 23rd. This river is not likely to be used for steam traffic, owing to its shallow rapids. The cities on it are ruinous, and occupied chiefly by new comers. Rice and other cereals, and sugar cane, are much cultivated, and the country above Ping-lo-fu is very picturesque, the hills sometimes having large caves which pierce them, showing the sky through. The people are greater flesh-eaters than those of other provinces, and the women do not as a rule cramp their feet. After a stay of a week, Mr. Mesny reached the Pei-sha-kiang, having crossed a plateau by water with an ascent of eight and descent of fifteen locks. There a large irrigating wheel, lifting water 30 feet above the river-level into troughs, was seen. On the third day from Kwei-lin-fu the main west river (Hsi-ho) was again struck, near Liu-chow-fu (Lioo-chow), now very quiet and partly in ruins. The width, depth, and slight current of the river appear to favour steam navigation, and though the branch starting near Yün-nan-fu is much the longer, this one is considered the principal by the Chinese, who give the preference to the one having the greater number of junks. Trade, therefore, was probably more prosperous here in former days. Ascending the river to Liu-cheng-hsien (Lioo-chin), where it again forks east and west, the traveller chose the Yung-ho or eastern branch, reaching Yung-hsien on the fifth day from Liu-chow-fu. This is a flourishing city, and would make a first-rate terminus for steam navigation from Hong-kong. Still ascending the Yung River, the shallows and rapids of which began to obstruct navigation, Ku-chow-ting, an important frontier city of Kwei-chow, was reached in ten days, the country traversed being entirely inhabited by a peculiar tribe of Miao-tze called Tung-kia, subsisting principally on a very glutinous kind of rice called No-mi, and living in two-storeyed houses, of which the lower storey is occupied by cattle, and the upper is almost destitute of furniture. At Ku-chow-ting, the smallest boats obtainable had to be used, and in eight days the head of all navigation was reached at San-kio, or Li-miao-chow, as it is called officially. An overland journey of eight days brought the traveller to Kwei-yang-fu, entirely through the country of the Miao-tze, who are gradually being displaced by Chinese immigrants, who follow the water-way, and drive the natives farther back into the country. Mr. Mesny considers that steamers might ascend from Hong-kong to Yung-hsien in three or four days without going to Canton, and that a railway might be laid from Yung-hsien to Kwei-yang-fu, *viâ* Li-po-hsien, Tu-shan-chow, Lo-hu, and Tein-fan-chow. This would, in his opinion, be remunerative if the mines of the province were opened, and the establishment of a trading line in this direction would also tend to the opening up of the extensive and rich copper mines of Yün-nan, to which the direct road is by the Hsi-ho. Mr. Mesny gave some interesting details of the habits, customs, and superstitions of the people amongst whom he travelled, e. g. Miao-tze, with a piece of board fixed with resin to their crowns for a three years' period; Yao-shun, with their temples quite bald; and Chung-kia of two tribes, Lo and Wei, agriculturists, excessively devoted to whisky distilled from the glutinous rice No-mi; and with hard-working women, whose morals until the birth of their first child in wedlock are peculiarly lax, and who sacrifice bulls and dogs to appease the manes of their ancestors.

Journey of Exploration in Southern and Eastern Borneo. By CARL BOCK.

Tuesday, August 31st.

On the North-east Passage. By Lieut. GEORGE T. TEMPLE, R.N.—Lieut. Temple sketched briefly the history of the North-east Passage since the ill-fated expedition of Sir Hugh Willoughby, showed how the way was gradually paved for the brilliant success of Baron Nordenskjöld, and recapitulated the advantages likely to accrue from the establishment of a regular trade between Europe and Siberia. He then gave an outline of Nordenskjöld's Arctic career up to 1876, and described the voyage of the *Vega* in some detail. The nature of the country and the manners and customs of the Tchuktches were also touched upon, and Nordenskjöld's summary of the immediate practical results of his enterprise was quoted. Lieut. Temple said he could not then review the various attempts which had been made to follow up the successful voyages of 1875 and 1876, but he might mention that several foreign vessels, specially built for the purpose, were actively engaged at that moment, and that the steamer *Nordenskjöld* was attempting the North-east Passage in the inverse direction. He might also mention, and he did so with great pleasure, that the sailing directions for the coast of Norway, to which he alluded at last year's meeting of the British Association, had now been published by the Admiralty, while some of the Norwegian charts were in course of preparation. As the coast of Norway must be regarded as the connecting link between Southern Europe and Siberia, while it is also of interest and importance to us for its own sake, it seemed to be a matter of regret that the work in question was not submitted to its compiler for final revision, as, in spite of the evident care and skill with which it had been prepared for the press, it was somewhat marred by errors which no stranger to the coast and language could possibly have avoided. Still, the publication of this work, with the necessary charts, would, he trusted, fill up the gap which had hitherto existed, for us, in the new commercial highway, and British seamen would be better able to take their share in the establishment of a regular trade route between Europe and the mighty rivers of Northern Asia, by means of which the vast, but hitherto pent-up, wealth of Siberia would find a natural outlet to the great commercial centres of the civilised world. The discovery of the North-east Passage might, altogether, be regarded as the most completely successful Arctic voyage that had ever been made.

An Examination of the Balearic Islands. By Dr. J. S. PHENÉ.—At Ciudadella, the capital of Minorca, Dr. Phené was furnished by the Alcalde with a native guide acquainted with the country districts, and was able to visit remote parts and study many remarkable objects undescribed in any books, Spanish or English. Of the extraordinary ancient remains in Minorca, he said, we have absolutely no historic information; the masonry indicates that they are Cyclopean of the oldest type, while that of the Nurhags of Sardinia, with which many suppose they agree, is not only in courses, but of wrought or well-trimmed stone. The grand feature of the Nurhags also is wanting, viz. the spiral staircase or ramp, which is found also in the Brocs of Scotland. The plan of the grandest structure in Minorca is square at the base and forms a pyramid, of which there is no example in Sardinia. There is historic reference to the Nurhags of Sardinia, and even their builder, Iolaus, is mentioned by Diodorus Siculus, but the antiquity of the remains in Minorca is lost in the mist of ages, or referred to the time of the very oldest of the mythological deities, Saturn. The works of Iolaus in Sardinia are described in a way to prevent mistake, and they are found to-day as then described—with the domes or θόλοι beautifully designed. There are some portions of these Nurhags which appear of an older date, and these may have been of the date of the towers in Minorca, as they are very rude, and from these Iolaus probably designed and improved and produced the present Nurhags, adding the staircase. The historian reports that in time of danger the inhabitants of Sardinia sought refuge not in the towers but in caves.

This appears also to have been a custom before the Nurhags were built, as every old tower in Minorca still has a cave close to it. The remains in Minorca differ, further, altogether from the Nurhags of Sardinia, by having, as a part of them, stone tables, said to be for sacrifice, and circles of monoliths, neither of which are found in Sardinia. If they existed previously, they were probably removed on the coming of Iolaus, and the new comers introduced their own religion. Another special class of monuments in Minorca differ altogether from anything in Sardinia. These are vast ships built of stone, of an immense age, as proved by their masonry. The monuments themselves, as shown by photographs, and compared with photographs of the earlier Cyclopean masonry of Greece, are found to be of the very earliest type. They assimilate more to the most ancient circular structures in Etruria than to any other remains. Dr. Phené then described the architectural beauties of the city of Palma, his various journeys and researches, the mixture of races, and quoted all the known classical references to these islands; remarking on the people, and their ancient and modern customs.

On a Recent Examination of the Topography of the Troad. By Dr. J. S. Phené.

Notes on the Dara Nur, Northern Afghanistan, and on the Chuganis and Kafirs. By Lieutenant-Colonel H. C. B. Tanner.

This paper will be published *in extenso* in a subsequent number of the 'Proceedings.'

A Visit to the Galapagos Islands in H.M.S. Triumph, 1880. By Captain A. H. Markham, R.N.—Captain Markham gave an account of a visit he paid to the Galapagos Islands on board H.M.S. *Triumph*, in the beginning of the present year. The Admiralty chart, compiled from a rough survey made nearly half a century ago, proved to be not very accurate, so that it was not safe for a large iron-clad like the *Triumph* to extend the cruise in the numerous channels between the islands. Her visit was, therefore, confined to Post Office Bay in Charles Island, and the paper recorded the observations that were made during several inland excursions. The Galapagos Islands, being 600 miles from any other land, have a peculiar fauna, and Captain Markham devoted all the time at his command to the collection of birds, insects, and mollusca. These specimens have been placed in the hands of Mr. Osbert Salvin, and it is anticipated that they will form an addition to our knowledge of the natural history of this isolated archipelago.

NEW BOOKS.

(By E. C. Rye, *Librarian* R.G.S.)

EUROPE.

Anderson, Sir C. H. J., Bart.—The Lincoln Pocket Guide: being a short account of the Churches and Antiquities of the County, and of the Cathedral of the Blessed Virgin Mary of Lincoln, commonly called the Minster. London (Stanford): 1880, 12mo., pp. 192, map, plans. Price 3s.

A generally descriptive account of the County, illustrated by a map (scale 7⅝ miles to the inch), of special value to archæologists.

Gamwell, S. C.—British Association for the Advancement of Science. Meeting at Swansea, 1880. The Official Guide and Handbook to Swansea and its district. Swansea (*Cambrian* Office): 1880, 12mo., pp. 194, map.

The annual meetings of the British Association have on more than one occasion of late years called forth the publication of local descriptive works of this nature, usually put together in too hurried a manner to be exhaustive. The value of the South Wales mineral fields has caused a certain amount of physical geography and geology to be incorporated in the present guide, besides the usual historical and economical matter. Some mention is also made of the palæontology and natural history, though Dillwyn's extensive treatise on the 'Fauna and Flora of Swansea,' prepared on the former meeting of the Association at the metropolis of South Wales, is neither noticed nor quoted.

Hirsch, A., & Plantamour, E.—Nivellement de Précision de La Suisse, exécuté par la Commission Géodésique Fédérale sous la direction de A. Hirsch et E. Plantamour. Septième livraison. Genève, Bâle, Lyon (Georg): 1880, 4to., pp. 449–489. Price 2*s*. 6*d*.

This section, published after an interval of three years, contains in addition to the Bellinzona-Chiasso section, of which the field-work was done in 1876, the operations in the Grisons during 1877–1879, resulting in the completion of the great diagonal which traverses Switzerland from Martigny to Coire and connects the triangulations of the Rhône and Rhine basins. The valleys of the Rhine and Inn have also been connected, and further approaches to the Italian system made in the direction of the Engadine.

Ragosin, Victor.—Volga. Vol. i., St. Petersburg (Retger): 1880, 8vo, pp. 387 & viii., pls. in text. Atlas, fo., vol. i., maps i.–ix. Price 11*s*.

This work, entirely in the Russian language, will when completed and translated, form a valuable addition to the literature of fluvial hydrography, having for its object a description of the entire course of the Volga. It will be completed in nine volumes, of which three will be purely geographical. The present portion comprises from Istoka to the junction with the Oka, illustrated by well-executed coloured maps of the various sections, preceded by two general maps of the St. Petersburg and Vichnevolots lacustrine regions.

AFRICA.

Careri, —, and Licata, —.—Relazione del Progetto di Spedizione ad Assab presentata all' Assemblea Generale dei Socii, il 15 Luglio, 1880. Napoli (Club Africano di Napoli): 1880, 8vo., pp. 25, map, price 10*d*.

The above-named members of the recently established Neapolitan African Club here propound the local advantages which they consider to be possessed by Assab, as a central station for Italian operations, with the aim of opening up trade routes in Southern Abyssinia and the adjoining countries. Assab lies between Massowah and Zeila, near the south-western end of the Red Sea, just above the Straits of Bab-el-Mandeb, and nearly opposite Mocha. The map shows the immediate vicinity (scale 1 : 1,500,000) and the countries on the south-western extremity of the Red Sea (scale 1 : 5,550,000).

NEW MAPS.

(By J. Coles, *Map Curator* R.G.S.)

WORLD.

Petermann's 'Geographische Mittheilungen.'—Uebersicht der Länder in welchen bisher wirkliche Volkszählungen stattfanden. Von H. Wagner. Petermann's 'Geographische Mittheilungen.' Ergänzungsheft No. 61. Bevölkerung d. Erde VI. Justus Perthes, Gotha, 1880. (*Dulau.*)

EUROPE.

Austrian Government.—Specialkarte der Oesterreichsch-Ungarischen Monarchie. Scale 1 : 75,000 or 1 geographical mile to an inch. 1880. Price of each sheet 1*s*. 4*d*. (*Dulau.*)

The following sheets are just published:—Zone 8, Column XV. Boskowitz und Blansko. Zone 8, Column XVI. Prossnitz und Wischau. Zone 8, Column XVII. Kremsier und Prerau. Zone 8, Column XXII. Hohe Tátra. Zone 10, Column XI. Budweis und Cratzen. Zone 11, Column XXI. Dettva und Libethen.

Danish General Staff.—Topographical Atlas of Jutland, published by the Danish General Staff. Scale 1:40,000 or 1·8 inch to a geographical mile. Sheets:—Bording, Nörre Snede, Rye, Gylling, Horsens, and Odder. 1880. (*Dulau.*)

Freytag, G.—Special-Karte der Gross Glockner-Gruppe. Nach den neuesten Aufnahmen d. K. K. Militär-geogr. Institut. Scale 1:40,000 or 1·8 inch to a geographical mile. Chromolith. Wien, Hartleben. Price 2*s.* (*Dulau.*)

Imfeld, X.—Panorama vom Monte Rosa. Vollständige Rundsicht von der Dufourspitze (4638 m.), dem höchsten Gipfel der Schwelzeralpen. Aufgenommen im September 1878 von X. Imfeld, Ingenieur-Topograph in Bern. Commissions-Verlag von J. Wurster & Comp. in Zürich. Price 9*s.* 6*d.* (*Dulau.*)

Kiepert, H.—Karte der neuen Grenzen auf der Balkan-Halbinsel nach den Bestimmungen d. Vertrages v. Berlin vom 13 Juli 1878 und der Conferenz von Berlin vom 24 Juni 1880 nach amtliche Quellen zusammengestellt. Scale 1:3,000,000 or 41·6 geographical miles to an inch. D. Reimer, Berlin. Price 1*s.* 6*d.* (*Dulau.*)

Kirchner, Prof. Dr. M.—Elsass im Jahre 1789. Die topographische Grundlage nach der französischen Generalstabskarte in 1:320,000 or 4·4 geographical miles to an inch, die Gemarkungen nach derselben in 1:80,000 or 1 geographical mile to an inch. Trübner, Strassburg. Price 5*s.* (*Dulau.*)

Leuzinger, R.—Carte physique et géographique de la France. Scale 1:2,000,000, or 27 geographical miles to an inch. Chromolith. Dalp, Bern. Price 2*s.* (*Dulau.*)

Liebenow, W.—Verkehrs-Karte von Oesterreich-Ungarn. Scale 1:1,250,000. Chromolith. Berlin, Berliner Lithogr.-Institut. 7 sheets. Price 5*s.* (*Dulau.*)

—— Specialkarte von Mittel-Europa. Scale 1:300,000, or 4·1 geographical miles to an inch. Blatt 71 und 85. Hannover, Oppermann. Price 1*s.* (*Dulau.*)

Prussian Government.—Karte des Deutschen Reiches. Abth. Konigr. Preussen und angrenz. Staaten. Scale 1:100,000, or 1·3 geographical mile to an inch. Herausg. v. d. Kartograph. Abth. der konigl.-preuss. Landesaufnahme 1880. Sect. 14, Tarup.—24, Augustenburg.—39, Kappeln.—40, Wester-Markelsdorf.—59, Lütjenburg.—60, Oldenburg i Holst.—61, Muritz.—84, Grömitz.—85, Kröpelin.—86, Rostock. Berlin. Engraved and coloured. Price of each sheet 2*s.* (*Dulau.*)

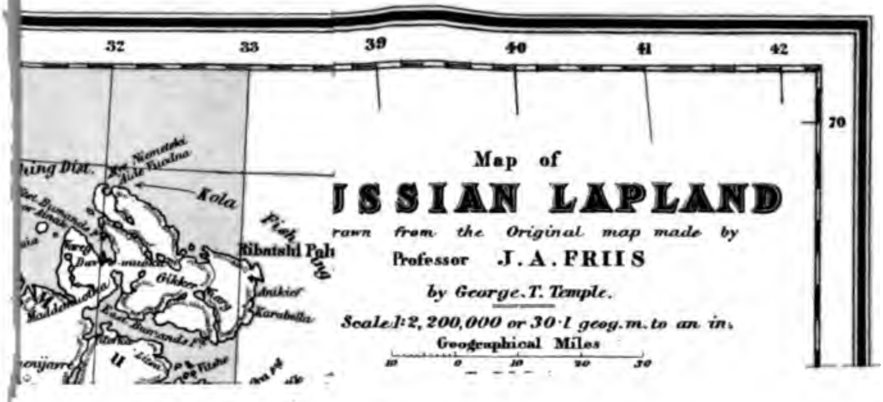
Seelig, —.—Eisenbahn- u. Strassen-Karte von Schleswig-Holstein. Scale 1:400,000, 5·5 geographical miles to an inch. Seelig, Hamburg. Price 1*s.* 6*d.* (*Dulau.*)

Stanford, Edward.—Greece and the Ionian Islands. Scale 1:950,000, or 13 geographical miles to an inch. Stanford, London, 1880. Price 5*s.*

This is Arrowsmith's map, published in 1876, with the following boundaries of Turkey and Greece inserted: Boundary according to the Protocol No. 1 of Conference of February 3rd, 1830; Boundary by arrangement of July 21st, 1832; Boundary as proposed by First Conference of Berlin, 1878; Boundary as settled by Second Conference of Berlin, 1880.

Stülpnagel, F. von.—Wandkarte von Europa zur Uebersicht der Staatlichen Verhältnisse. Dritte Auflage, 1880. Neu gezeichnet von V. Geyer. 9 Blätt. Scale 1:4,000,000, or 55·5 geographical miles to an inch. Justus Perthes, Gotha. Price 14*s.* (*Dulau.*)

Wagner, J. E.—General-Karte vom Nordlichen Böhmen. Scale 1:220,000, or 3 geographical miles to an inch. Chromolith. Prag, Kytka. Price 1*s.* (*Dulau.*)


32
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Map of
USSIAN LAPLAND
rawn from the Original map made by
Professor J.A.FRIIS
by George.T.Temple.
Scale 1:2,200,000 or 30·1 geog.m. to an in.
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PROCEEDINGS

OF THE

ROYAL GEOGRAPHICAL SOCIETY

AND MONTHLY RECORD OF GEOGRAPHY.

Expedition of Lieutenant F. Schwatka to King William Land.

By C. R. Markham, C.B., Secretary R.G.S.

Map, p. 720.

The publication of the interesting narrative of the expedition of Lieutenant Schwatka of the United States Army, in the 'New York Herald,' is of considerable geographical interest, while it once more draws attention to the fate of Sir John Franklin and his gallant companions.

The enterprise was undertaken in the hope of discovering the journals of the Franklin Expedition, and of throwing additional light on its sad history by examining the west coast of King William Island in the summer, when the snow is off the ground. The party consisted of four white men, namely, Lieutenant Schwatka, Colonel W. H. Gilder the author of the narrative, Harry Klutschek, and Frank Melms. They wintered at Camp Daly, near the entrance of Chesterfield Inlet, on the west shore of Hudson's Bay, adapting themselves to the mode of life of the Eskimo (or *Inuit*, as Colonel Gilder more correctly calls them), and making preliminary reconnoitring journeys.

It was Lieutenant Schwatka's intention to effect his purpose with the aid of natives and their dogs; and his plan was to march across the unknown land between Chesterfield Inlet and the estuary of the Back River, and thence to examine the western side of King William Island, a formidable enterprise, which would certainly occupy many months.

The expedition left Camp Daly on the 1st of April, 1879, with three sledges and a load of 5000 lbs. drawn by forty-two dogs. Besides walrus meat, the provisions consisted of biscuit, corn starch, pork, compressed corned beef, cheese, tea, and molasses. But these supplies were not calculated to last more than a fraction of the time, being one month's provisions for the whole party. The main reliance was upon the game afforded by the region to be traversed. The party was entirely deprived of vegetable diet, they took no lime-juice, and there was no scurvy; which is one more stubborn fact for the consideration of the English Scurvy Committee. Besides the four white men, the party consisted of Joe, the Eskimo interpreter, and his wife; a splendid hunter and dog driver named Toolooah with his wife and child; two other Inuit men with their wives and a child each, and two lads; altogether thirteen Inuit men, women, and children.

During the months of April and May the party marched across a high country of rolling hills, with much snow, and occasional deep drifts. The thermometer was above freezing, and the sun insufferably hot. Plenty of reindeer were seen nearly every day, the herds being often chased by wolves, which also prowled round the camp. The game indeed was so abundant that, besides bears and seals and four musk oxen, the party obtained, during the journeys out and home, no less than 522 reindeer. The landscape, though sombre and forbidding, was grand, and occasionally presented scenes of great beauty. At one place they came upon a frozen waterfall 25 feet high, which sparkled as if studded with myriads of gems. In the first week of May they crossed the Arctic Circle, and soon afterwards came upon a branch of the Back River, which they followed for 90 miles. It flows through a gorge with dark hills rising to 800 or 1000 feet on either side. On the 22nd of May they reached the estuary of the Back River, having travelled all the way through a country filled with game, and having seen two or three large herds of reindeer every day. The river which led them to the Back estuary was named after the President of the United States.

Lieutenant Schwatka visited Montreal Island, and then crossed the land to an inlet west of Richardson Point, collecting many stories from the Eskimo. In June he crossed over to Cape Herschel on King William Island, and examined the western shore with the greatest care, for relics of the Franklin Expedition, as far as Cape Felix, the northern extremity of the island. The summer travelling was extremely severe and difficult, the snow being converted into slush and water, and the country consisting either of morasses or of rocks and ridges formed of sharp-pointed stones. During the return journey in July they were pestered by dense fogs, had to wade through swamps, and in one place they were obliged to cross a river with the water up to their waists. But the game was still abundant. The reindeer began to move southwards in September, and at a camp, near Cape Gladman, the party shot as many as twenty-six in one day.

The return journey was commenced in November, by ascending the Back River for some distance, and then marching over the region intervening between that river and Hudson's Bay, by a route to the westward of that taken on their outward journey. This line took them across the valley of the Quoich River, which was explored by Dr. Rae in 1853, to their original starting-point at Camp Daly; whence they proceeded southwards to Marble Island, where a whaler was wintering. In December and January the land still abounded in game, and the breath of the reindeer could be seen on every hill-side, rising like clouds of steam.

The cold of the winter months, in this country, is intense, and in January the thermometer fell as low as 70° below zero (Fahr.). The lowest temperature registered on board H.M.S. *Alert*, at the most northern point ever reached by any vessel, was 73° below zero, being the mean of several thermometers. The difference between the climate of the Arctic Regions, and of the Hudson's Bay territory south of the Arctic Circle, consists in the much longer duration of intense cold in the extreme north, and in the fact that the minimum temperature is reached, not in mid-winter, but in the month of March. This is due to the long absence of the sun. The maximum cold is probably as great in the Hudson's Bay Company's territory as in any part of the world. But the mean cold of the year is much greater in the Arctic Regions.

The achievement of Lieutenant Schwatka and his companions is most remarkable, and in some respects his journey is without a parallel. It reflects the highest credit on the commander, and on those who served under him so admirably; and it is certain that the work could not have been done without natural qualities of a very high order, combined with careful training and the most thoughtful adaptation of the best attainable means to the end in view.

The English nation, and more especially its naval service and its geographers, have received the news of this noble effort to obtain more complete intelligence of our lost heroes with feelings of warm gratitude to Lieutenant Schwatka and his gallant companions, as well as to those who generously supplied the means and gave the instructions under which the explorers acted.

It is important that the information collected by Lieutenant Schwatka should be carefully compared with that which we already possessed, in order that it may be known whether he and his predecessor Captain Hall have materially supplemented the work of Sir Leopold M'Clintock, and to what extent. With this object in view, a very brief recapitulation of our former knowledge is necessary.

In the spring of 1854, when Dr. Rae was exploring a part of the coast of the Boothia Isthmus, he met some Eskimo in Pelly Bay, who told him that some years before, in the spring, a party of about forty white men were seen travelling over the ice and dragging a boat, along the coast of King William Land. Later in the season the bodies of about thirty were found on the continent, and five on an island, near the mouth of the Great Fish River. The information was obtained at second-hand, none of the Eskimo with whom Dr. Rae conversed having seen the white men. Several relics of the Franklin Expedition were bought from the natives, and sent home.

With this clue as a guide, Lady Franklin despatched the *Fox* to discover the fate of Franklin and his brave companions, under the command of Sir Leopold M'Clintock, who did his work thoroughly and successfully. During April and May 1859, M'Clintock and Hobson, travelling from their winter quarters, examined part of the west coast of Boothia, the whole of the shores of King William Island, the mouth of the Back River, and Montreal Island. M'Clintock also collected information, with great diligence, from the Eskimo he met at various points, within eleven years of the catastrophe.

The main result of his search was the discovery of the record at Cape Victory, and with it the discovery of the fate of Franklin. This document, as is well known, gave an outline of the proceedings of the expedition up to the time of abandoning the ships, the date of Sir John Franklin's death on board, and approximately that of Commander Graham Gore, the exact number of deaths of officers and men; it incidentally mentioned that Lieutenant Irving, of H.M.S. *Terror*, was still alive, and stated the intention to commence a retreat to Back's Fish River with all the survivors—105 officers and men—on the following day, April 26th, 1848. The document was signed by Captain Crozier, of the *Terror*, and Captain Fitzjames, of the *Erebus*.

No scrap of writing has since been found. All exact information is derived from this document. There is nothing else but conjecture, based on the vague and unreliable stories of the Eskimo, and inference derived from relics and their positions. With these as a means of illustrating the facts of the record, M'Clintock pieced together the sad but heroic story. The ground at Cape Victory was strewn with great quantities of clothes and stores, pointing to the probability that the survivors had overrated their strength, and were obliged to lighten the boats which they were dragging on heavy sledges. The discovery of Lieutenant Hornby's sextant made it probable that he was among those who landed. Further on, in Erebus Bay, one of the boats was found on a sledge, with two bodies in it, and many relics of various kinds. Among them was a Bible, the 'Vicar of Wakefield,' and a little volume of private devotions which Sir George Back had presented to his old friend Graham Gore. Perhaps it was the thoughtful act of some messmate to bring away the little book for the relations of the deceased officer. The boat's head was pointed back to the ships, indicating that a portion of the retreating crews had broken down, and that an attempt was made to return to the ships and bring back fresh supplies of food. The rest pushed on, and M'Clintock found a skeleton beyond Cape Herschel, proving that they discovered the North-West Passage. But the great majority of the bodies probably fell through the ice on which they walked, when the thaw came, and found a last resting place in the great deep.

The information, carefully collected from Eskimo by Mr. Petersen, M'Clintock's interpreter, was to the effect that many of the white men dropped by the way as they went to the Great Fish River; that some were buried and some were not, a fact discovered by the Eskimo during the following winter, and corroborated by the position of the skeleton which M'Clintock found beyond Cape Herschel. It was also ascertained that one ship had been seen to sink in deep water, and that the other was forced on shore by the ice. On board the latter, the body of a tall man was found, but there was little then left of the wreck, the position of which was indicated. At one time the natives had seen many books and papers, but they had all been thrown away or destroyed long before. It was clear that the record at Cape Victory would furnish the only certain intelligence we should ever receive.

Thus was the sad history brought to light by Sir Leopold M'Clintock. Nothing more of any consequence will ever be certainly known. Nor is it desirable. Sherard Osborn, the personal friend of many of the lost ones, gave expression to a feeling in which others shared. "Why attempt to lift the veil with which the All Merciful has been pleased to shut out from mortal ken the last sad hour of brave men battling with famine and disease?" We know that the surmises and assertions of savages are false, and we regret that they should have been unfeelingly repeated. It was not thus that our heroes died. "They passed from sight into the snow-storm which the warm south wind kindly sends to shroud the worn-out ones who gently lie down to die; and they died peacefully, calmly, with their minds sweetly wandering back to the homes and friends of their childhood, the well-remembered prayer upon their lips, and their last fleeting thoughts of long-treasured love for those they would one day meet in heaven."

But curiosity, with the best intentions, could not allow the matter to rest here, and some few minor details have been added to the painful story, by the efforts of Captain Hall and Lieutenant Schwatka. The stories which these explorers obtained from the Eskimo, the former ten, the latter twenty years after the date of M'Clintock's exhaustive investigation, and thirty years after the event, cannot for a moment be accepted when they in any way disagree with information carefully collected so many years nearer the time. Captain Hall, in May 1869, just touched the line of retreat at Todd's Island and Peffer River. He heard that seven bodies were buried at these places, and he brought home bones supposed to have been those of Lieutenant Le Vescomte, of H.M.S. *Erebus*. He heard the story of the wreck of the ship, and of one body of a tall man having been found on board, and he was also told that a boat and a tent full of bodies were seen by the Eskimo in Terror Bay, some miles south of the position where M'Clintock and Hobson found the boat. There is nothing improbable in the latter story, but it is not corroborated by Lieutenant Schwatka who carefully searched the spot. This, however, does not disprove it, as all traces might easily have been obliterated, in the long lapse of time. Captain Hall also heard that the boat with the last survivors did not reach Montreal Island, but an inlet on the west side of the promontory which terminates at Point Richardson.

Lieutenant Schwatka confirms the accuracy of Hall's information on this last point. The natives told him that a boat and a number of skeletons were seen near the water-line in this inlet, and that books and papers were scattered among the rocks and long since lost. The boat was turned over, and the skeletons were beneath it. One body, perhaps that of the last survivor (not an officer), was found five miles inland. An old woman also told Lieutenant Schwatka that she saw the retreating party dragging a sledge with a boat on it, and she described the personal appearance of three of the officers. One seems to have been a doctor. She also alleged that she saw the tent and dead bodies, of which Hall heard, at the head of Terror Bay.

Lieutenant Schwatka's personal search along the west coast of King William Island was not rewarded by any important discovery. The work of M'Clintock and Hobson had been done too thoroughly. He, however, found the grave of an officer near Cape Victory. It was assumed to be that of Lieutenant Irving, of H.M.S. *Terror*, because a silver medal was picked up near it, which proved to be a mathematical prize won by that officer at the Royal Naval College in 1830. The grave of another officer was found near Point Le Vescomte, and some bones of five other different individuals. They were collected and buried. Near Cape Felix two cairns were met with, probably erected for taking bearings by parties which landed during the year before the ships were abandoned. These few details add very little to the history so well told by M'Clintock.

We already knew enough. We knew that our gallant countrymen died in discovering the North-West Passage, and that they fell in the performance of their duty. There could be no more glorious end. In Sherard Osborn's charming memoir, and in the admirable narrative of Sir Leopold M'Clintock, the heroic story of the Fate of Franklin will be read, with unfailing interest, by generation after generation. And Englishmen will, at the same time, always cherish a feeling of gratitude for the kindly deed of the brave Americans who tenderly collected and buried some of the bones of our heroes—a task which, we well know, entailed no small amount of peril and hardship.

A Journey to Central Uruguay. By Dr. D. Christison.

Map, p. 720.

Before proceeding to the proper subject of this paper, a short general notice of Uruguay may not be out of place, as it is a country less known than might be expected considering its accessibility, four-fifths of its area indeed never having been described at all, so far as I am aware.

The Republica Oriental del Uruguay, better known, perhaps, under its former name of the Banda Orientál, is of a compact form, situated between lat. 30° and 35° S., and is about equal in area to England, Wales, and the lowlands of Scotland. The published maps are far from being accurate. The best that I have seen are in Petermann's 'Mittheilungen,' 1857, p. 406, and 'Ergänzungsheft,' No. 39, 1875, both founded mainly on one by Don Jose Maria Reyes, of date 1848. The second, on a smaller scale than the first, introduces a number of additional names, derived from an official report in 1865 on the postal service of the Republic. A glance at the first of these maps shows that Uruguay is remarkably well watered, seamed in fact everywhere by important rivers with numerous tributaries. It seems at first sight also that it must be an extremely mountainous country, but this impression is due to the difficulty of distinguishing on a map between mountains and trifling elevations. In reality the ranges so conspicuously represented, and bearing the imposing titles of Cuchilla, Serra, or even of Cuchilla Grande, are nothing more, in the southern half of the Republic at least, than gently sloping ridges, rarely rising 200 or 300 feet above the neighbouring valleys, forming the main watersheds, but scarcely differing in any respect, save their greater continuity, from the innumerable unnamed, unrepresented ridges and swelling downs which constitute the general mass of the country. The northern half of Uruguay, and the Cuchilla which runs southwards through it from Brazil, are no doubt of a more hilly character, but as far as our vague knowledge of them goes, they nowhere deserve to be called mountainous.

Taking advantage of these watersheds, Uruguay may conveniently be divided into four districts:—1. The Eastern, included between the main Cuchilla—a prolongation of the coast range of Brazil—and the Atlantic, with an area of about 170 miles by 100, and drained into the ocean mainly by the Rio Cebollati. 2. The Southern, 200 miles by 60, forming the northern shore of the Rio de la Plata, bounded on the north by a western prolongation of the main Cuchilla, and drained by the Santa Lucia and a number of minor streams almost entirely into the Plata, a few only finding their way into the Uruguay near its mouth. 3. The Central and Northern district, considerably the largest, measuring about 250 miles by 140, drained westwards into the Uruguay by the Rio Negro. 4. The North-western, 150 miles by 80, also drained into the Uruguay, but by a system of numerous comparatively small streams.

In the earlier map only thirty-three inhabited places are marked, of which not more than six are at a greater distance than 30 miles from the coast or Rio Uruguay. In the later map the number is increased to ninety-six, of which thirty-seven are in the interior, but the great majority are places of little importance; many are probably mere postal stations, and not a dozen deserve the name of towns. Monte Video indeed is a noble city with 105,000 inhabitants, but according to the map of 1875 no other town had more than 10,000 and only five had above 3000. The total population is not accurately known, but although still scanty it has greatly increased within the present century. Azara in 1801 gave it as something under 30,000. In 1855 it was estimated at only 50,000, but this was probably much below the mark, as five years afterwards, according to an official census, it amounted to 240,000. The most recent estimate, in 1876, gives it as 440,000, but Diehl, the German Consul at Monte Video, believes that 350,000 is nearer the truth. The rural population, almost entirely engaged in pastoral pursuits, probably does not exceed 200,000 souls.

Reverting to the four natural divisions of Uruguay, it appears that our knowledge of the southern one only can be considered full and satisfactory. It enjoyed the advantage of being visited in the years 1822, 1826, 1832, and 1856 successively by four distinguished travellers, Auguste de St. Hilaire, D'Orbigny, Darwin, and Burmeister, and little remains to be added to their descriptions beyond the filling in of details. The two last-named extended their observations into the valley of the Rio Negro near the mouth of that river; but as far as I can ascertain no other portion of its large basin, which forms the Central division, has been described. The Eastern division is only known along the coast by the too brief *aperçu* of St. Hilaire, while the North-western is wholly uninvestigated.

The publication of the following notes has been delayed mainly by a sense of their imperfection, due chiefly to debility after illness, which, although the cause of my residence in Uruguay being prolonged from a few weeks to ten months, deprived me in a great measure of the power to make investigations. My efforts were fortunately aided by information from my obliging and intelligent hosts at the Estancia of San Jorge, and I am particularly indebted in this respect to Dr. Fair, the late Mr. Dale, Mr. Charles Hall, and Mr. Allan Watson. It was only, however, after the kind reception accorded to a portion of my observations by the Botanical Society of Edinburgh two years ago that I was encouraged to make this second venture, and the delay is, I believe, of little consequence, as the changes which have occurred in the last twelve years—mainly due to the introduction of railways—have been but few, and I have been well informed of them by Messrs. Watson and Hall.

1. Journey to San Jorge.

In 1867 the iron horse had not yet invaded Uruguay, and the choice of modes of travelling for all who could not conveniently go on horseback, lay—as is still the case everywhere beyond the lines of rail now opened—between the slow tortures of the bullock waggon or the more acute jolting of the diligencia. Having chosen the latter, our party started early in the morning on the 2nd of April, and after rolling smoothly along the few miles of macadamised road which existed in the Republic, found ourselves at daybreak traversing a zone of partially cultivated land, which a few leagues further on gave place to the pure campos, uncultivated, unfenced, stretching away northwards for several hundred miles to beyond the frontier of Brazil. Rarely could so great a contrast be seen between town and country as at that time in Uruguay, and in most parts there has been but little change to the present day. Leaving Monte Video, we seemed to plunge suddenly from the highest civilisation of the present time into the semi-barbarism of the middle ages. The large handsome city, with its squares, boulevards, clubs, theatres, tramways, and every kind of luxury or convenience, differed in no way from a superior European town; neither was there anything in the dress or manners of the people to distinguish them from citizens of the old world; but beyond the few leagues of cultivation in the environs of the city lay a grassy wilderness, without roads, bridges, fields, groves or gardens, with scarcely a town or village, inhabited by a wild race of horsemen, dressed in medieval-looking costume, always armed, scarcely amenable to law, and esteeming homicide an accomplishment rather than a crime.

The diligencias, which connect these strangely diverse worlds with each other, differ materially from European stage-coaches. Our vehicle, indeed, was merely an open, low, light, but strong omnibus in three compartments, holding twelve passengers; but the very simple harness was of raw hide, and the six half-broken or unbroken horses, arranged, four as wheelers and two abreast as leaders, were driven in a manner quite peculiar to the campos. As, in the ordinary modes of driving, the inequalities of the rude tracks over the campos might not be seen in sufficient time to prevent accidents, a "cuartiador" rides about twenty yards ahead of the team and conducts it by means of a strong rope of hide, which, fastened to the pole and loosely connected with the bridles of the leaders, is firmly attached to the saddle of his horse. Generally he holds the rope in his right hand so as to lead the team more skilfully, but at times he drops his hold and allows the full power of his horse to come into play to help the others out of a difficulty, or by a sudden swerve to clear some unexpected obstacle. The "mayoral," sitting in the vehicle, holds the reins of the wheelers, but they are of little use except to pull them up, and his chief employment is to belabour the poor animals, and stimulate them with the vilest epithets which the

Spanish language contains or his own ingenuity can invent. In these duties he is ably seconded by a reserve "cuartiador" who, riding up in all emergencies, vies with his master in the force of his blows and the originality of his oaths. As the Gaucho has little humanity in his disposition and as the horses are only worth a few dollars, no mercy is shown to them. Continually urged beyond their strength, if one chances to fall it is dragged along bruised and bleeding till it struggles up again, and it is no uncommon occurrence to abandon exhausted animals prostrate and apparently dying on the campos; but it takes much to kill these hardy beasts, and probably before the diligencia is out of sight they have risen and begun to feed on their way home.

The stages were short, but the delays at them very long. On arriving nothing was generally to be seen but a miserable mud hovel, with a saddled horse standing half asleep at the door, and an empty corral. Sauntering out and leisurely lighting his cigarette, a Gaucho would then mount and canter off till he became a mere speck in the distance. In from half an hour to an hour he would reappear, driving before him a "tropilla" of horses which, following the bell-mare, are easily driven into the corral. A long gossip then takes place and the maté-cup is passed round. At last the mayoral enters the corral, lassoes one after the other the horses he requires, and leads them out to the diligencia. Sometimes an animal is selected which has never been harnessed or handled before, and it is only after a long struggle, requiring the utmost skill and strength of the mayoral and his assistants, that it is subdued, great roughness being used in lassoing and throwing it down, while it is approached and handled gently in harnessing. When all is ready the half-broken horses start off with a bound, while the novice throws himself down, jumps up again, rears, plunges, and vainly strives to break the stout hide ropes. Very soon the older animals settle to their work, hurrying on the new victim, till he too is tame enough as, trembling and bleeding, he reaches the end of the stage.

The course we took, like all the main routes in Uruguay, bore the imposing title of "camino real." But they are all mere tracks over the campos, chosen so as to avoid the steepest hills and other natural obstacles, particularly streams, for there are no bridges, and only a few of the large rivers are provided with "balsas," or rafts, by means of which vehicles may be ferried over in case of floods. These caminos are easily recognised on the surface of the campos, as they are much cut up by the massive wheels of bullock waggons, and in the softer parts are as wide as a good-sized field, from the vehicles encroaching more and more upon the fresh grass to avoid old ruts. Only at the "pasos," or fords, is there any sign of man's handiwork, when it has been absolutely necessary to cut the steep banks to give access to the river. Perhaps no better idea of the smooth easy nature of the country can be given than by stating that it can be traversed over the natural turf from north to south and east to west by ordinary stage-coaches.

The aspect of such a country is, of course, tame and monotonous. From the higher elevations the eye ranges over a few leagues of country, disposed in low, gently sloping downs or ridges, covered with grass, and generally unbroken by tree, bush, or rock. These ridges seemed to me to rise generally about 60 feet above the neighbouring valleys, and rarely to exceed three times that height; but it must be remembered that the tendency is to underestimate the elevation of ridges so wide that their slope is often barely appreciable to the eye. On account of this great width, which often amounts to several miles, the view is seldom very limited, even in the bottom of the broad, shallow valleys. Protected by their covering of turf, the slopes are unfurrowed by ravines, and show little trace of erosion by water, and even the majority of the hollows we passed were equally smooth. Some, however, were traversed by arroyos which, after a prolonged drought of nearly three months, merely contained a few stagnant pools. These watercourses were generally serious obstructions, as, even when only a few yards wide, they were a good many feet in depth, with nearly perpendicular sides and sharply defined margins. In the first day's journey we crossed only two streams with running water—the Santa Lucia and Santa Lucia Chico. A long "seca" had withered the grass to a dull grey colour, but it had nowhere left the earth bare in extensive patches. The autumn inflorescence, however, was completely checked, the only plants in flower being the prickly xanthiums (*X. spinosum* and *macrocanthum*), well-known plagues of the sheep-farmer in every warm latitude, and here going by the names of the "cepa caballo" and "abrojo grande." Withered stems of the cardoon thistle still stood in groves, but nowhere in the enormous fields which take possession of the land in the south-west of Uruguay or in Buenos Ayres; and as we went northwards they gradually disappeared. Herds and flocks were pretty frequently in view, but other signs of man's occupancy were rare. After passing the Santa Lucia, early in the forenoon, we saw no town or village till we reached Florida, at the end of our day's journey; and with the exception of the wretched puestos where we changed horses, we did not pass near to a house of any kind. Now and again, however, two or three faint dark streaks on the horizon indicated the solitary rancho and corral of a herdsman. More rarely a greater collection of similar streaks, surrounding a whitish mark, pointed out the larger establishment of an estanciero, with his more solid "azotea," or flat-roofed house. No trees, shrubs, or gardens surround these unhome-like dwellings, which all stand bare and naked on the summit of the ridges. Once or twice we saw two or three black dots standing like vedettes on the top of a distant hill. These were ombús (*Phytolacca dioica*), large, handsome, shady trees, with soft, pith-like stems, which must surely have been planted there as landmarks over these monotonous earth-waves, almost as destitute of individuality as the rollers of the ocean.

At first the campo had been singularly free from rocks and pebbles; it was therefore with some surprise that I saw a loosely aggregated mass of stones, like a huge cairn, on the summit of a ridge within a few leagues of Florida. Nearer to the town similar groups of stones were constantly in sight, consisting of squarish blocks, arranged in an artificial-looking manner, sometimes as if shot out of a cart, at others in lines resembling ruined walls. They followed the direction of the ridges, generally on the top of them, but sometimes on their slopes. I had no opportunity of examining them closely, but in passing took them to be of gneiss or granite. There was no exposed rock surface on the camino, but it was strewed with large pieces of white quartz. The Cerro de Florida, a low, much compressed, conical hill near the town, appeared to be covered with scattered large-sized rocks. These artificial-looking groups are probably related to the much more remarkable chains of gneiss rocks seen by Dr. Burmeister 50 miles further west, and compared by him to the "Teufelsmauern" and "Felsenmeere" of Germany.* They were called "Serras" where he saw them, formed true though miniature mountain ranges, and were situated on the watershed between the Rio de la Plata and Rio Negro. At Florida they are considerably to the south of that watershed.

We came rather suddenly in sight of the little town, a solitary white patch on the vast expanse of grass, situated on a ridge about a league ahead, from which projected the low conical cerro already mentioned. At the foot of the ridge flowed the Santa Lucia Chico, its course marked out by a fringe of scrub and low trees, and between us and it lay a wider, better marked valley than any we had hitherto passed. Our fatiguing journey had lasted thirteen hours, the distance in a straight line being about 45 miles. Deducting the four or five hours lost in stoppages, and allowing for the windings of the camino, the pace kept up must have been not less than six miles an hour.

The second day's journey began inauspiciously. Heavy rain had fallen during the night, the ground was already softened, and it was with difficulty that the mayoral was persuaded to start about 8 A.M. The country differed in no way from that which we had passed on the previous day, but was even more desolate. Often for miles together not a house was to be seen, and rarely was more than one in view at a time. No tree or bush, not even a solitary ombú, disturbed the monotony of the scene, and we did not meet a soul on the camino except a "tropero" with his retinue of eight well-mounted Gauchos driving a herd of cattle to the Saladeros of Monte Video. These untamed animals, starting at every new sight or sound, tossing their heads and long curved horns, snuffing the air, now bounding forward suddenly at full speed, now checking themselves in mid career, seemed to be nearly as wild as deer, and our mayoral took good care to give them a wide berth and pass slowly, lest the unwonted sight of our equipage should scatter them in terror over the plain.

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* 'Geog. Mitth.,' 1857, p. 408.

Some hours after leaving Florida we must have crossed the Cuchilla Grande, which forms the Rio de la Plata-Rio Negro watershed, but there was nothing to distinguish it from the numerous low ridges crossed in the course of the day. At first we passed a few heaps of stones, similar to those seen on the previous day, but in general the ground was quite free even from pebbles. "Puntas" of eight or ten ostriches (*Rhea americana*), two or three being old birds and the others half-grown, now began to appear and became more frequent as we went northwards. They were often feeding along with cattle or horses, and took little notice of the diligencia, allowing it to come within two hundred yards before moving off at a leisurely walk. Graceful little deer (*Cervus campestris*) in parties of three or four were not uncommon, but they were wild, and fled over the adjoining ridges at a singularly swift, long trot, or galloping by a series of astonishing leaps and bounds.

While still struggling over the heavy campo, night overtook us, and as at the same time a violent thunder-storm with heavy rain came on, ominous hints were dropped by the mayoral that we should have to spend the night on the campo and sleep as we best could in the diligencia; but by a skilful application of flattery and brandy he was persuaded to make another effort. New and more fearful oaths were invented, the horses were urged on by loud shouts of "Ha!" prolonged into a kind of diabolic laughter; and at last, aided in finding our way by the lightning, which almost incessantly played in the clouds, and every now and then descended to the ground, we were painfully dragged to the door of the inn at Durazno, having accomplished the journey of 55 miles, in a straight line, at the rate of about seven miles an hour, deducting stoppages, in spite of the heavy state of the camino.

As there was no improvement in the weather on the following day, the mayoral announced that the diligencia would cease running for the season, and that we must shift for ourselves for the rest of the journey. Durazno is the largest inhabited place in the interior of Uruguay, and the only one perhaps at all worthy of being called a town, yet it is doubtful if it contains more than 3000 souls. Like all small Spanish American towns, it has a singularly dreary aspect. The narrow, ill-paved or unpaved streets, equidistant, and at right angles to each other, bound so many squares, facing outwards, and consisting of low, one-storied houses, with few windows to the street, and these strongly barred. A rectangular plaza, with a plain whitewashed church at one side, adds by its very spaciousness and neglected condition to the desolation. No shady groves or gardens ornament the environs, but the town stands as a bare white patch on the gently sloping plain. The only object that breaks political disturbance, to prevent people from speaking to each other in the streets. An unfortunate Frenchman engaged in collecting objects of natural history, forgetting the regulation, paused to speak to a passing friend, and was instantly shot and mortally wounded by a policeman. During the last civil war eight prisoners were executed in the town. An eye-witness described to us the revolting scene. Smoking cigarettes, they stood in a row against a wall while the executioner coolly walked along in front of them and cut their throats one after the other! A few months after our visit, an unfortunate prisoner trying to escape was pursued by the police and speared through the back in the river. To these recent cases, which are a mere selection from many, may be added the murder, at an older date, of a fellow-countryman of my own uncommon name, who, to my surprise, I found had settled as a land surveyor in this obscure place many years ago.

On the seventh day of our captivity we were relieved by the arrival at the other side of the Yi of a carriage and horses kindly sent by Mr. J. Fair from the Estancia of San Jorge. The Yi is the largest tributary of the Rio Negro; and opposite Durazno, about 90 miles from its source and 30 from its mouth, ordinarily flows in a bed 20 to 30 feet below the level of the campo, with a good ford. But now it had risen out of its bed, and in some places had inundated the country for miles around. We crossed it in a small boat, where it was about 400 yards wide, running with considerable force, and so deep that a horse swimming behind us lost its footing at once and did not regain it till close to the other side.

The country under the influence of the late rain was now of a vivid green, alternating with vast sheets of a buttercup yellow colour produced by a species of oxalis, the peculiar pride of Uruguay in autumn. The ground, however, was still heavy, and darkness overtook us long before we could reach the "pulpería" * where we intended to pass the night. Calling a halt, a Gaucho was despatched to ask for food and shelter at a hut which was fortunately still visible in the rapidly increasing darkness, relieved against the sky on a distant ridge. While waiting for his return I heard a peculiar sound like muffled bleating, and, thinking it proceeded from sheep hidden by a neighbouring mound, I beguiled the time by strolling along to look at them, but was surprised to see nothing. The Gauchos laughed, and told me that the noise came from "tucotucos" beneath my feet. This interesting animal (*Ctenomys brasiliensis*), resembling the mole in its habits, is described by Darwin ('Voyage of the *Beagle*,' p. 50). Here also I saw a large brown spider, beautifully marked with black, about eight inches in breadth from toe to toe, marching swiftly and steadily in a straight line over the grass.

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* The country stores throughout Spanish America bear this name, although the intoxicating fluid "pulque," obtained in Mexico from the *Agave americana*, from which the name is derived, is unknown in the Southern Republics.

the arched roof was of zinc. Like all Uruguayan waggons it was open at both ends, so I caused the front to be shut with planks, leaving a space at the top for light, and the back could be closed in at pleasure by means of an ox-hide. This comfortable apartment was nicely balanced on a single pair of lofty wheels placed well forward, and as the pertigo or shaft was in one piece with the body, the shaft and floor rose gradually from the necks of the oxen backwards to the further end, where the floor was six feet from the ground. We had, therefore, to provide a rough ladder to keep up our communication with the world. The wheels were upwards of six feet in diameter, very broad and constructed entirely of wood, the pieces being so skilfully wedged as to become all the firmer from the shocks they received.

In Uruguay each waggon is drawn by three or four span of oxen, large powerful animals, driven by a "picador," who, armed with a "picana," rides alongside his team on an old nag, the whole train being under the command of a mounted "carretero" or "patron." The rate of travelling is estimated at from 20 to 24 miles a day, but diverse accidents are apt seriously to diminish this ideal rate, so that a journey accomplished under favourable circumstances in a week, may at other times last six times as long. Thus in rainy weather it may not be prudent to yoke the animals or to persevere in a journey for fear of chafing their necks; or a heavy state of the campos may act as a continual drag; or a flooded stream unprovided with a balsa may detain a carretero for days, perhaps even for weeks, unless he boldly risks the tedious plan of carrying the loads over in a leaky boat, and floating the carts across on barrels, while the cattle take their chance of swimming. As it turned out, our journey of about 150 miles was made in eight days, twenty-four hours of which were lost by rain, so that the rate of actual travelling was about 21 miles a day.

The mode of travelling, owing to the necessity of sacrificing six or eight hours of daylight for grazing the animals, implies a good deal of marching at night. Our usual routine was to start about midnight, sometimes in perfect darkness, so that nothing but the sagacity of the animals enabled us to find the way; halt at 7 or 8 A.M.; and march again from noon till 4 or 5 P.M. At sunset the oxen were tied to their respective yokes in order that they might be found in their places in the midnight darkness. The hour of starting and length of the marches, however, were regulated by the fords—some of which were passable in the dark, others only by daylight—and by the position of suitable grazing grounds, wood, and water. For these reasons the halts were generally made at pleasant spots on the banks of streams, wood in particular not being obtainable anywhere else.

March 31*st*.—Having laid in a few stores, and relying on being able to purchase sheep on the journey as we required them, we started at noon by the waggon route which goes nearly in a straight line south-was made, the water reaching to the bellies of the oxen. Resuming our march, after encountering another swollen stream, which however was less formidable, we camped on its further side at 3.40 P.M. near some scattered houses and a lofty rock, standing up among others of lesser note like the gable of a ruined cottage, from which the spot takes its name of "Piedra Alta." I regretted being unable to reach this stone, which looks all the more remarkable from the apparent paucity of others in the neighbourhood. When unyoking, Pedro lost his temper with an obstinate bullock, and first, boy-like, bursting into tears, suddenly drew his knife and rushed at it, but was caught in time and gravely rebuked by the patient Reynolds.

3rd.—Started at midnight, crossed the Sauce, a small stream half a league from the Yi, and came upon that river at the Paso Polanco, probably about 30 miles above Durazno, in the grey dawn of a damp misty morning, not a moment too soon, as the water was rapidly rising. The approach to the ford passed between scattered bushes of espinilla (*Acacia Farnesiana*), but we could see in the dim light that, both above and below, a dense and lofty "monte" extended to the very edge of the river bed. The stream was running pretty swiftly 20 feet below us in its channel, here about 200 yards wide, which it did not yet fill to the edge, being still separated from the steep banks by a slope of beautiful yellow sand. The ford ran first a long distance down stream and then took a sharp turn upwards with a dangerous laguna on the further side. Descending to the channel by a cut in the bank we at once commenced the passage, each cart crossing in turn, guided by our whole staff, prancing about in the stream, prodding the unfortunate cattle with their fourteen-feet picanas, shouting to them "Ah! Vinagre! Viva Tigre! Vuelta Pistola! Tira Fortuna!" But in spite of all their efforts one team, with the determined obstinacy which sometimes seizes waggon bullocks, would turn down stream at the fatal spot, towards the laguna, where they and the cart would have speedily disappeared, when the patron changing his tactics soothed them with a prolonged "Oosh oo-oosh" from the whole party, which brought them to a halt, and then he succeeded in turning them in the proper direction. Finally, all got over in safety; and after pressing on for about a league we halted at 8 A.M. on the Tala, a pretty little brook with scattered talas (*Celtis Tala*) and willows (*Salix Humboldtiana*) on its banks, and sarandís (*Cephalanthus Sarandi*), growing something like osiers, in its bed. The talas—thorny trees resembling our hawthorns in size and general aspect—were adorned with the splendid yellow clusters, three or four feet in length, of the *Cassia corymbosa*, which growing with a free stem under its protector, forces its way through the branches to flower at the surface. On the same trees might also be seen the brilliant scarlet masses of the parasitic *Loranthus cuneifolius.* In this pleasant spot we rested till 3.15 P.M., and after the watchful patron had prevented the passionate foot in depth. A marked rounding of their tops indicated the first steps of a separation from each other laterally and from the general mass behind. Isolated groups of stones, standing like rocky islands in the sea of grass around, were evidently similar rock masses which had completely broken up and fallen to pieces. I also observed that the grooved pillars had a great tendency to split transversely at the waist. D'Orbigny travelled for three days by bullock waggon among similar rocks between the Santa Lucia and Rosario. One of a mushroom-like form he describes as being so highly polished on all its faces as to resemble a work of art. He was inclined to ascribe the peculiar degradation of these rocks to the action of water. From the fact of the groovings I saw being deepest on the northern faces, my impression was that fine sand blown by a prevailing northerly wind might have been the agent; but it is difficult to account for the tendency to extra action about the middle of the masses on either supposition, and certainly at the present time the amount of blown sand must be trifling, as the campos are well covered with grass which rarely disappears to a serious extent even in the severest droughts.

Starting again at 1.15 P.M., we crossed the Juncal Grande and then went right over another low cerro covered with rocks at the top. Soon afterwards we came upon the withered stems springing from a clump of green leaves of the first cardoon thistles we saw in this journey. A few of the broad variegated leaved thistle (*Carduus Marianus*) were mixed with them. Camped about 4 P.M. at the Puntas del Mendoza.

6th.—Started at midnight, forded the Sauce at dawn, and, as the sun rose, the Santa Lucia, the most considerable river in the southern or Rio Plata division of the Banda. At our halt, a league beyond the river, was the first agricultural farm we had seen.

7th.—We were now in a comparatively well-peopled agricultural country; but still there were wide stretches entirely given to pasture, and it was only when a league north of the town of Las Piedras that we came upon hedges, chiefly of the *Agave americana*, and a few trees.

On the afternoon of the *8th*, we entered Monte Video.

The amount of traffic on this main communication with the centre and north of Uruguay seemed singularly small. In the first six days of our journey, before approaching the zone of agriculture near the city, we only met five waggon trains with twenty vehicles in all, and about half a dozen men on horseback.

3. DESCRIPTION OF SAN JORGE.

The district to which for convenience I have given the name of San Jorge, by which it was known while owned solely by the Messrs. Fair, has been more accurately mapped than perhaps any other part of the Banda Orientál, thanks to a survey made in 1867 by Don Juan Frugoni, an Italian "agrimensor" settled at Durazno. It has also been described, From a rounded western spur of this cuchilla, Mr. Hall got examples of grey and liver-coloured quartzite, and from the north spur of the westerly cuchilla, nearest to San Jorge house, conglomerate sandstone, described by Professor Geikie as evidently derived from the waste of volcanic rock. Mr. Hall also traced a close-grained volcanic rock, probably a dyke, running from east to west for at least 15 miles, about five or six yards in width, cropping out distinctly at intervals, but traceable nearly everywhere.

In seeming conformity with the distribution of the rocks, the soil in the Carpintería district is a black, stiff, tenacious clay; that of the Chileno, sandy; and that of the Rio Negro, according to Mr. Mutter, black, unmixed with sand to the west of the Cerrillada ridge, and a rich sandy loam to the east of it. The black soil opens up in summer into cracks several inches wide. It is difficult to work, but produces good crops. A pit dug near the Guayavo Estancia passed through three or four feet of this black soil, then through 10 feet of clay, to a soft, crumbly rock. On the sides of some of the arroyos, there is exposed a salt clay which the cattle are fond of licking; but it is not indispensable to their health, which Azara alleges in a general way to be the case in the Banda, as they thrive equally well on the sandy campos where it is absent. Neither is the name "barrero," applied to it by him, known here.

San Jorge is remarkably well watered, being almost enclosed by the Rio Negro and its tributaries the Carpintería and Chileno, while numerous arroyos flow through it into these streams from the cuchillas which form the backbone of the district.

The Rio Negro, by far the largest of these streams, rises in Brazil, traverses the Banda in a south-westerly direction, and falls into the Uruguay, near its mouth. Its length, independent of innumerable minor bends, is about 320 miles, and it drains nearly one-half of the Republic. At San Jorge, midway in its course, the bed of the river, which is generally sunk 15 to 20 feet, or more, below the level of the nearly flat valley through which it flows, averages from 100 to 200 yards in width. Concealed in this sunken bed, the river is further shrouded from view by a dense, almost impenetrable belt of trees and shrubs, which following its windings and cut off by a sharply defined margin from the bare campos, seems itself to meander along like a river of foliage. In a few places this "monte" disappears and gives access to the river, but there is only one ford for carts—the Paso Perez*—in the 25 miles stretch of river which borders San Jorge. There are some "picados," however, places where the river can be reached and crossed on horseback. After long droughts the stream shrinks within its bed and may almost be have a very barren aspect. In some places they produce forests of "paja" (*Arundo Selloana*), called "pajonales," gigantic reeds, tall enough, in situations favourable to their growth, to conceal a man on horseback. The inundations of the Rio Negro on the San Jorge side are of small extent, but in some places on the north side attain a width of several miles.

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* The nearest fords to the Paso Perez are the Paso Polanco, opposite the little town of San Gregorio, about 25 miles up, and the Paso Bustillas at a somewhat greater distance down the stream.

At San Jorge, as in the better known parts of Uruguay, vegetation assumes two very different forms in situations which, although contiguous, are clearly marked off from each other. The great mass of the country is covered with grass, but destitute of timber, while meandering as it were through these naked campos in company with the rivers are the montes, or dense belts of trees and shrubs already noticed in connection with the Rio Negro.

The grass of the campos is somewhat coarse and bunchy, but generally resists drought well; continuing to clothe the earth, although almost as dry-looking as hay, in ordinary summers, and leaving the ground bare to an extensive degree only after prolonged droughts. Even then, the temporary destruction of the grass is due perhaps as much to the close cropping by certain kinds of stock, particularly sheep and mares, as to the simple effect of the drought. In spring and autumn numerous flowers adorn the campos, the *Compositæ* claiming the largest number of species; but the peculiar glory of the country is the genus *Oxalis*, which from the abundance and persistence of its inflorescence takes the place of our daisies and buttercups. In autumn in particular, the whole country is dotted over with vast dense sheets of two unnamed species with yellow flowers, pleasantly interspersed with the purple *O. martiana*. White, red and scarlet verbenas, many liliaceous plants, and a fine œnothera (*Œ. af. albicaulis*) may be mentioned as special ornaments of the San Jorge campos. With the exception of two or three coronillos (*Scutia buxifolia*) and a single espina de la cruz (*Colletia cruciata*) the only native tree found on the true campos at San Jorge is the thorny tala (*Celtis Tala*). At a distance from water, however, it occurs in few localities and in small numbers, greatly preferring, like the two others, to frequent the montes, or to spread in a scattered way along the margins of the smaller streams, to many of which it gives its name. A solitary ombú (*Phytolacca dioica*) in one place, and two growing together in another, exist on the campos. It is here a hardy enough tree, although liable when young to have the leaves destroyed by frost.

The montes, or wooded tracts, occupy an altogether insignificant area compared with the campos. Confined to the margins of the rivers, they only here and there, on the larger streams, attain a width of from a mile to a mile and a half; and as we ascend to the smaller arroyos they gradually thin out, until only a few scattered willows, talas, or sarandís remain, and hence the infinity of arroyos in the Banda bearing the names Sauce, Tala, or Sarandí, to the perplexity of the geographer or traveller. Too often, even on streams of considerable size, these solitary trees disappear, and nothing disturbs the normal bareness of Uruguayan scenery. I was familiar with the names of about twenty species of trees and shrubs in the montes, but probably there are many more. A great proportion of the timber is low and crooked, the general mass being often dominated by the comparatively lofty willows (*Salix Humboldtiana*). In not a few places, however, taller, straight-stemmed trees, 40 to 50 feet in height, are met with. The most durable timber, used for supports, corral posts, &c., is got from the coronillo (*Scutia buxifolia*) and molle (*Duvana dependens*). Laurél (*Oreodaphne acutifolia*) makes good furniture; vivaró is preferred for carts, and sauce (*Salix Humboldtiana*) for roofing. The guayavo (*Feijoa Sellowiana*) is one of the few trees or plants that yield an edible fruit. Nearly everywhere the dark recesses of the montes are almost impenetrable from the prevalence of prickly climbers and brushwood, and they are generally fringed with the thorny espinilla (*Acacia Farnesiana ?*) or ñapindai (*A. bonariensis*). The nullahs which permeate the montes probably limit the timber growth by maintaining irrigation only to a certain distance from the streams. For further botanical details, and for a description of the climate, I refer the reader to my papers in the 'Transactions of the Edinburgh Botanical Society,' 1878, and in the 'Journal of the Scottish Meteorological Society' for the present year.

The mammals of San Jorge include the puma, now seen only rarely; a species of fox; the comadreja, or opossum; comadreja colorado, resembling a ferret; mano pelado, or racoon; zorillo, or skunk; an otter with a yellow throat; the *Cervus campestris;* aparea, or guinea-pig; carpincho, or capybara; nutria; a small rat-like rodent, which burrows everywhere in the campos; several species of smaller rodents, or mice; and two armadillos, the peludo and mulita. The jaguar and a large species of deer, once common enough, have not been seen for many years, and only one great ant bear has been met with in recent times.

The birds of San Jorge are numerous, and their habits are easily studied from their extraordinary tameness. I have walked up to a fine grey and white eagle sitting on a corral post till I could have touched it, and have pelted with clods another large eagle, perched on a low tree, for several minutes before it would take to flight. Flocks of pretty black and yellow finches rest, during their migration, in the San Jorge Quinta, and sing all day, quite regardless of man's presence within a few yards of them. Even the rhea ostrich allows a man on foot to approach within seventy yards before walking or trotting off, according to the pace at which it is followed. I never observed the rhea use its wings to increase its speed, although this is commonly asserted in books. Neither is it probable that this can often happen, as the ostriches of a "punta," when disturbed, commonly run in different directions. Moreover, nothing less than a brisk breeze could assist their natural swift pace. When at full speed the wings are held apart from the body, as a runner does with his arms, to ease respiration and preserve the balance of the body by throwing them out to one side or other when making sudden changes in their course. I saw only one species of humming-bird. A common belief that the noise of the humming-bird is produced when the creature is poised in the air seems to me to be erroneous; at least, in the few instances in which I have met with these birds, the noise was only produced as they darted from one place to another. I do not think it has been commonly noticed that the turkey buzzard belongs to the small class of birds whose flight is accomplished without flapping the wings. I have watched them for hours as they sailed in vast circles, now descending to the ground, now rising into the heavens, without detecting the slightest independent movement in the wings, which are kept steadily in such a position that at a distance the bird resembles the letter V.

The most important insect in Uruguay, from its immense numbers and destructive habits, is the leaf-cutting ant. In general form, and in having three pairs of spines on the back and one pair on the head, besides lesser spines and tubercles, it resembles the leaf-cutter of the Amazons, described by Mr. Bates, but it differs in colour, which is a dingy black, in the absence of the second and third classes of workers, and in its nest. The San Jorge campos, and I believe those of Uruguay in general, are parcelled out among communities of this ant, their nests being generally about 100 yards from each other, with five or six beaten paths radiating from each till they approach the domains of their neighbours. Along these paths a double stream of workers constantly pours, one towards the country, the other returning to the nest, each ant holding aloft a piece of grass, leaf, or flower. During three months in spring and summer, when I watched them closely, they worked all day, and probably all night, as I saw them busily engaged so late as 11 P.M., and again long before sunrise. Although preferring some plants to others, scarcely any leaf comes amiss to them. Young trees have to be protected by a tin cylinder, stuck in the earth round the stem, and provided with a flange projecting outwards and downwards from the top. The ants either cannot or will not pass the angle thus formed; but let the most slender communication be made, by a mere blade of grass, and the ants, pouring across, will strip a small tree in half an hour. Gardens can only be saved by the destruction of the nests—no easy task, as they are very numerous in the neighbourhood of such rich booty, and are buried several feet in depth, with subterranean winding approaches, often many yards in length, difficult to follow. Care must be taken on finding the nest not to uncover it till all is ready for its destruction by boiling water or poisonous solutions, otherwise the nest will be deserted, the inhabitants making their escape to some other subterranean retreat. The nest, composed of earth and leaves, is of a much compressed spheroidal shape, land under cultivation was altogether inappreciable on the vast grassy surface of the campos. Fences too were almost unknown, always excepting the indispensable circular corral of stakes at every puesto, and the large "manguera," capable of holding five thousand cattle, at the head stations. At that time about 100,000 sheep and 60,000 cattle, besides 3000 horses, were kept in the district. When I arrived the cattle were managed on the native system, being subjected to no other restraint than a periodical assemblage of the herds at their respective "rodeos," unfenced spots in their feeding grounds where all the necessary operations of cattle management are carried on by the wonderful skill of the Gauchos in horsemanship and the use of the lasso. Under this system the cattle are scarcely less wild than deer, their aspect and movements scarcely less noble, free, and majestic. But alas! as too often happens, the picturesque and useful do not agree. Cattle do not fatten well when so easily scared that I have seen them take fright at the sight of a man half a league off, and not cease galloping till they vanished behind some far-distant ridge. It was resolved, therefore, to tame them, a process which I partly witnessed, and which deserves notice, as I believe it has not hitherto been described.

Its essence consists in driving the herds, usually numbering from 1000 to 1500 head each, into a manguera day after day till the animals become perfectly tame. The first difficulty is to move them from their rodeo without causing a general panic and break up of the herd; for this purpose advantage is taken of the circling movement to which the animals are accustomed, in order to indulge their natural restlessness, at their ordinary musters. Surrounded by about thirty well-mounted Gauchos, this wheeling movement is constantly maintained, while the herd is slowly urged from the rodeo in the required direction; and with such patience must this be done that sometimes it takes an hour to move them the first 100 yards. In this cyclonic fashion the whole march is made till the herd approaches the manguera. And now the scene, as I beheld it once from the mirador of San Jorge, becomes singularly beautiful and stirring. The rolling campos stretching for leagues beneath me, usually so silent and deserted, are animated by three bellowing herds, one moving from the manguera, another towards it, and the third to some neighbouring pasture, each attended by a guard of thirty mounted Gauchos, with its reserve of one hundred spare horses following in the rear. Now halting, now advancing, sometimes in dense order, at others opening out and threatening to fall into confusion, as small bodies breaking away make a rush for freedom—a few successfully, but the greater number quickly driven back by the active, watchful Gauchos—every manœuvre is clearly seen in the bright sunshine on the gentle slopes, without a tree or house to distract the eye.

But now one of the herds is nearing the manguera, and it seems madness to think of driving these 1500 excited creatures into it, through a gateway only a few yards wide. Perhaps it would be impossible without the aid of treachery. About 100 yards from the gate three large clumsy oxen may be seen, standing motionless, gazing stolidly about them, and lazily flapping the flies from their sides with their tails; these are sleek traitors who betray thousands of their fellows to slavery and death, being used as decoys on all occasions. As the herd comes near, a man in charge urges the traitors towards the gate, and, as they break into a trot, slips aside. The whole herd comes thundering after them, and now the great art is to check the speed of the terrified and excited crowd, to prevent too great pressure at the gateway; but in spite of every care bulls break away, and soon in half a dozen directions horsemen may be seen galloping madly after the runaways, swinging the lasso or bolas over their heads. At first they seem to gain but little on the fugitives, particularly going down hill, but gradually they draw up, out flies the lasso, and the next thing you see is, perhaps, a bull standing on his head for a second and then lying all of a heap on the ground! One way or another all that are overtaken are stopped or overthrown, and either driven back, or if obstinate towed along by two or three horsemen whose lassos are fastened to the horns. Sometimes several "puntas" of six, ten, or a dozen animals break away at once, bolting in every direction, and all seems lost; but the skilful Gauchos rarely fail to secure the great mass of the herd. When all have entered, the three traitors, who have wisely stationed themselves close to the gate and coolly watched the rush of the captives, quietly slip out to enjoy their well-earned supper. The poor prisoners, confined within a fence for the first time, spend the whole night in running up and down, bellowing and lowing without a moment's cessation. A risk still remains that, seized by panic, they may all rush at once to one side, break down the corral and kill many of their own number in the crush. To diminish this risk, men remain round the corral all night, who by talking, whistling, and shouting restrain their impetuosity. In the morning they are let out to pasture, carefully guarded by a strong body of men, and so the process is repeated till in a wonderfully short space of time the herd walks into prison of its own accord and can be driven by a single man.

But of late years other changes begin to threaten the supremacy of pastoral pursuits on the San Jorge campos. Agriculture has made a start, and possibly the day is not far distant when it may assume an important position in Central Uruguay. Thus Mr. Hall, now of San Jorge, writes lately, "It is wonderful to me to see how fast the custom of sowing a little maize, pumpkins, &c., is growing. Fifteen years ago I do not believe there were four plots of ground turned up for grain on the Messrs. Fair's property; to-day on the same area there cannot be fewer than forty, containing probably one hundred times the acreage that was ploughed at that time."

The rapid introduction of wire fencing is another remarkable sign of progress from primitive pastoral habits. Ten years ago, with the exception of the corrals, and a few small paddocks and gardens, there was not an enclosed plot in the district; now, I am informed by Mr. Hall, it contains 116 miles of wire fencing. This change is not confined to San Jorge; fifteen gates have to be opened in riding between it and Durazno. In fact the delightful power of riding anywhere across country, which was one of the chief charms of life in the Banda, no longer exists.

These alterations have been accompanied by a complete revolution in the ownership of San Jorge deserving attention, indicating as it does the variety of races which have attained a footing in the country generally, and the large proportion of the land which is now held by foreigners. Some years ago four-fifths of San Jorge came into the market, and the result of the sales has been that only one-third has fallen to native owners, while another third has passed into the hands of Brazilians, the remainder being divided among British, Canarians, Italians, and Basques. In all parts of Uruguay there is a marked tendency of the land to pass into the hands of foreigners. This intrusion of aliens is probably in general beneficial, by introducing more civilised and settled habits, and, with one exception, none of these races can be regarded as politically dangerous. The British, for example, rarely become permanent settlers, as they do not like the prospect of their children being brought up as "Orientáles" subject to the dangers of revolutionary wars and the corruption of native laws, while the children of the few who do marry natives and settle in the country are generally observed to be "more native than the natives." Spaniards, Basques, Italians, &c., amalgamate readily enough with the general population. But it is different with the Brazilians. Their intrusion is more of the nature of a national movement. Rarely intermarrying with the natives, they bring their own women, dependants, and slaves; thus, wherever they settle, tending to oust the Gauchos altogether from the land. The extent to which this conquest by purchase has prevailed must be very considerable. It is believed that the Brazilians already own one-half of the land north of the Rio Negro, or about a fourth of the whole Republic, and it appears from statistics recently published in the 'Économiste Français' that they hold a seventh of the property of all kinds in Uruguay. As yet they have scarcely broken ground to the south of the Rio Negro, but their recent purchases at San Jorge show that they have no intention of confining themselves to the north bank of that river. Unfortunately these peaceful and industrious emigrants are universally detested by the Gauchos, whose reckless but not ungenerous disposition ill accords with the penurious and somewhat tricky character of the intruders.

It must be owned, indeed, that the Gauchos extend their hatred to foreigners in general, particularly, I know not why, to Italians. Y this rule does not apply to the British estancieros established amon them. Here as elsewhere our educated countrymen assert the unrivalled capacity for managing races in an inferior stage of civilis tion. By a combination of firmness, justice, liberality, and kindness th successive managers at San Jorge have won the esteem of the whol population, and it was astonishing to see the ascendency which m friends there exercised over even the wildest characters among one o the most intractable and homicidal races on the face of the earth.

In maintaining this position of honour and usefulness, our country men in Uruguay have in general no assistance from the officers of th law; but for some years before my visit San Jorge had been favoured b having a Comandante of rather unusual energy and efficiency, wh freed the district from many of the worst characters by quietl executing them, on the plea of attempts at escape after capture. Roug justice certainly, but the only kind possible in a country where th foulest murderer, once lodged in jail, is in perfect safety, sheltered fro punishment by public opinion—which, indulgent without measure t homicide, cannot bear the idea of judicial executions—and certain o eventual escape through interest or bribery at no distant date. It i a melancholy proof of the general state of the police in Uruguay tha all travellers and visitors from other parts of the Republic agreed tha nowhere save at San Jorge, where this rude system of justice existed had they heard a good word spoken for the police. Yet even Comandante Jose Jesu Rosano was not free from the reproach of showing partiality to members of his own political party.

If the Comandante was far from being immaculate, he was at least more to be trusted than his force, which was recruited from all the "broken" men in the country. Not only was the principle of settin a thief to catch a thief carried to excess, but the distinguished murdere of yesterday might become a swaggering sergeant to-day, and be outlawe as a brigand on the morrow. The aspect of the troop was strictly i keeping with their origin. Rarely was a trustworthy face to be see among them. Their costume varied from the smart uniform of sergeant to the simple poncho, and nothing more, of some newl recruited gambler; and their arms comprised many types of sword, rusty pistol, a "trabuco" or blunderbuss with expanding mouth, and half-moon pike. With such a following Rosano looked more like leader of brigands than a Comandante of police; but this much could be said in his favour, that he was rarely accused of executing any one who did not richly deserve it.

It may be doubted, however, whether the "policia" of Uruguay does more to promote or restrain the homicidal tendency which is perhaps more strongly developed among the Gauchos than in any other race. At San Jorge, during my ten months' residence, nine homicides occurred in a population of about a thousand souls; and of sixteen men weighed and measured by me at that time six are known to have since perished by the knife. An old resident believes that nearly one-half of the young Gauchos in the district die by violence, and I have been assured by Englishmen from other districts that matters are just as bad with them. The majority of these deaths arise from hasty assaults or duels with the knife at pulperías, where the Gauchos assemble and too often get excited with drink. Some check was put upon this mortality lately under the strict dictatorship of Latorre, who forbade the wearing of a deadly short sword called "facon," and ordered all lethal weapons to be laid aside at a certain distance from pulperías; judicious measures too likely to fall into disuse in the confused whirl of Uruguayan political strife.

GEOGRAPHICAL NOTES.

The Society's East African Expedition.—Mr. Joseph Thomson, the leader of our East African Expedition, has returned to England, and will read a paper descriptive of his journey and discoveries, at the first Evening Meeting of the new Session, on the 8th of November.

Mr. B. Leigh Smith's Visit to Franz-Josef Land.—The persevering efforts of our Associate, Mr. Leigh Smith, to increase our knowledge of the Arctic regions in the neighbourhood of Spitzbergen, have this summer been rewarded with more than usual success. In his steam yacht, the *Eira*, he has reached Franz-Josef Land, and explored a considerable part of its south-western side, navigating his vessel as far north as 80° 20′, on the meridian of 40° east. From this point, land was visible some 40 miles further to the north-west, and Mr. Leigh Smith is of opinion that this westerly coast forms a practicable basis for explorations towards the Pole. The southern coasts of Franz-Josef Land were traced for about 110 miles westward of the point named Cape Barents by the Dutch Expedition of 1879, and in 80° 5′ 25″ N. lat., 48° 50′ E. long., a sheltered harbour was found, with secure anchorage in from five to seven fathoms. Excursions were made up neighbouring fiords, and in places where a landing was effected, a luxuriant vegetation and bears were found. The *Eira* arrived safely at Peterhead, after her brilliant cruise, on the 12th of October.

The Dutch Arctic Expedition of 1880.—Our honorary corresponding member at the Hague, Captain Jansen, sends us the following account of the voyage, this summer, of the exploring vessel the *Barents*:—"Our Arctic exploring ship, the *Barents*, has been very unfortunate this year, having struck on the reef of Cross Island (off the north coast of Novaya Zemlya), where she lost nearly the whole of her keel, and was nearly

wrecked. Still, after getting afloat again, and not
as far as Ice Cape, and found there the ice from th
a north-west direction. Although convinced the
towards the north, her condition induced Capta
to run any risk with a disabled ship, which, h
manageable, refusing to answer her helm in stay
22nd August from Ice Cape, and arrived on the
merfest.—The chief result of the expedition has
great many observations on the state of the ice
Brockhuijsen having determined its position fro
in July.—He came to the conclusion that this
winds had been prevailing, bringing great qu
Barents Sea, old and young ice with many icebe
water between for a steamer. In fact, it was a ve
to Franz-Josef Land, and I am very glad to hea
availed himself of this opportunity, he having
coasted it to 45° E. in 80° 20′ N., sighting land
westerly direction about 40 miles off. In an o
the ice depends entirely upon the prevailing wi
and during the summer. Every year we have
tion, and I should require several years' longer
sufficient knowledge to advise an expedition
Land, although we know that in two years we
it without any difficulty in August or Septembe
more experience by sending every year a small
Leigh Smith to investigate the condition of the
and found that we can reach Franz-Josef Lan
two years, then we may think about winteri
sledges, but not before.—The *Barents* sailed to
station on Novaya Zemlya, and from there pro
limit in 76° 40′ N. and 56° E. in a thick fog, ind
ice. There was a strong westerly current, and
the ice stretching south. The commander foun
to try Matotschkin, but to go along the west co
Ice Haven. The thick fogs the expedition me
water, and they were in great expectation of rea
September, when they struck on Cross Island re
compelled to return. In the middle of August
was closed by ice. No steamer could get thr
the Yenisei."

French Surveying Expedition to West Af
alluded to in our last issue,* left Bordeaux for S
Major Desbordes being in chief command, and M
of the staff of surveyors. From St. Louis the expe

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* *Ante*, p. 628.

Senegal by boat to Medina, and then proceed by land along the left bank of the river as far as Bafulabé, at the confluence of the Bafing and Bakhoy. At this point, which is 900 miles from the coast, they will establish the first fortified station, and commence their surveying operations, the general nature of which we have already indicated. Beyond Bafulabé it is not anticipated that they will meet with any difficulty in following the course of the river to Fangalla, at the junction of the two rivers forming the Bakhoy, where a second fortified post will be formed. Up to this point the route for the railway will follow the course of the river, but beyond Fangalla a careful survey of the country will be required before any decision can be arrived at as to the precise route which it will be most advisable to follow. Documents, however, which are already in the hands of the authorities, lead them to believe that no serious obstacle will be encountered in the 250 miles of country between Fangalla and the River Niger, in which fortified posts will be established at Goniakuri, Kita, and Bangassi. In their south-eastward march the surveying parties will reach the water-parting between the two river-basins, which is not far from the Niger, and is of no great elevation; and it is hoped that an easy route may be found across it to either Bamaku or Dina, both of which places are situated higher up the river than Yanina and Ségou.

Italian Explorers in Central Africa.*—There would appear to be no foundation at present for the rumour recently current that the Sultan of Wadai had given permission to the Italian exploring expedition to pass through his territory to Bornu, Baghirmi, and Sokoto, for in a letter dated August 1st, Dr. Matteucci states that he had returned to El-Fasher, having failed to conciliate the goodwill of the Sultan of Dar Tama. His plan is now to obtain guides to conduct his caravan direct into Wadai, where he will halt about 30 miles from the capital, and despatch a messenger to ask leave of the Sultan to visit it. Should this project not meet with success, Prince Giovanni Borghese will, it is believed, return to Italy, while Dr. Matteucci and Lieutenant Massari will march round the southern frontiers of Wadai, and so reach Baghirmi and Bornu, whose ruler is believed to be less fanatically disposed than the Sultan of Wadai. At the date of Dr. Matteucci's letter the rainy season was stated to be very bad, and rendered marching extremely difficult, as well as astronomical and geographical observations. Lieutenant Massari was, however, actively engaged in collecting material for a map of the country traversed by the expedition, which will doubtless prove useful in supplementing our existing information respecting that little-known region.

The Algerian Missionary Society's Expeditions to the Victoria Nyanza.—According to letters which have lately reached Mgr. Lavigerie, articles of food are met with; fowls are cheap; sheep and goats are procurable, but scarce. The only cattle seen were at Sombe's, some 10 miles from the lake shore. Mr. Hore found the *tsetse* fly everywhere, even to within half a mile of Sombe's village, where the cattle are strictly kept within safe limits. On the coast line of Ulungu the villages are met with in clusters or districts, with intervals of forest-clothed hills or *pori*, and each chief is probably quite independent in his own little district. Mr. Hore brings three of these districts to the notice of the Directors of the London Missionary Society as suitable localities for a station, viz. Liemba* Harbour (marked in the late Dr. Mullens' edition of Mr. Stanley's map as Ma-Zombe), Sombe's country, and the Lofu River; the first and last because they are comparatively populous districts, and Sombe's country, because it lies at the south-east corner of the lake. There is a regular highway from the south end of the lake to Unyanyembe and Ujiji, and any persons stationed there, Mr. Hore points out, would be but little more isolated than at Ujiji.

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* Cf. *ante*, p. 564.

The Batanga District, West Coast, Africa.—Our Associate, Mr. D. G. Rutherford, sends us an interesting account of a visit, extending over four months, which he has made during the past summer to Batanga, a district on the West African coast, lying between the Cameroons River and Corisco Bay. Lying out of the route of the mail steamers, and having no large river, this part of the coast is very little known, though it offers many points of interest. It is covered with forest up to the slopes of the mountain range called the Sierra del Cristal, which here approaches nearer to the coast than it does in any other part, rising in the north in rounded hills, and in the south into peaks from 2000 to 4000 feet high. At distant intervals there is a native village, at some of which a solitary European trader resides. The coast is rocky, the formation being chiefly indurated schist much altered by igneous action; through this the small rivers have eroded their beds, on their way from the hilly interior to the sea. Mr. Rutherford visited first a place called Malimba, at the mouth of the Borea River, where he remained several weeks, making excursions up the neighbouring creeks and investigating the natural history of the district. He afterwards obtained a passage in a small coasting vessel to a small trading station, nearly 50 miles south of Malimba, and ascended a creek near there to the village of Mahambé, some 60 miles in the interior, where he was well received by a good-humoured native chief, who gave him facilities for exploring the neighbourhood. He here captured the famous *Papilio Antimachus*, a gigantic butterfly of extreme rarity, originally discovered by Smeathman more than a century ago, and the exact locality and habits of which were not previously known. The furthest point south reached on this expedition was the village of Batanga, the journey to which was performed partly on foot along the coast and part in a small the resources of the region lying between Griqualand West and the Molapo River. According to his report, it is occupied by several tribes, the chief of which are the Batlaro, Barolong, Batlapin, Mari Batlapin, and Koranna. The Batlaros are engaged in agricultural and pastoral pursuits, but owing to the great uncertainty of rains, and the general scarcity of water, cultivation is confined to the valleys and beds of the Kuruman, Matlaring, and Monhowing rivers, which are more rivers in name than in fact, having only here and there small pools and springs during the rainy season. The people, however, contrive to raise Kafir corn, *imphi*, mealies, pumpkins, and tobacco in considerable quantities. Among the Batlaros, Captain Harrel says agriculture is carried on by means of ploughs, of which, as well as ox-waggons, they own great numbers. Their chief possessions are their cattle, which they distribute among numerous cattle posts, in order to diminish the risk of disease spreading among them. They carry on a considerable trade in ostrich feathers, which they procure from their hunting grounds in the Kalahari Desert, and in karosses, in the manufacture of which they are very expert. They are temperate and frugal in their habits, and very capable in business matters. They number about 10,000, and are reported to be a peaceable race, using their arms only for defensive purposes. Leaving the Batlaro territory, Captain Harrel next visited Moroquane (or Morokwaan), a district comprising some 2000 huts, and under the rule of a Barolong chief. The water supply here is obtained from fountains situated at the edge of a large pan or *vley* near the town. The people have extensive tracts of land under cultivation, and possess numerous cattle, sheep, and goats, besides being in other respects apparently in prosperous circumstances. The number of this subdivision of the Barolong tribe is believed to be 10,000. Captain Harrel then proceeded further northward, and struck the Molapo and Settlakane, where he found the whole character of the country to change for the better. About 35 miles up this river valley he came to Pitsani, a village under an independent chief, and after an interview with him he proceeded to Schuba, a town about 50 miles south of Pitsani. This is the most important town of the Barolong tribe, and is ruled by a chief named Montsioa. The people of the town and adjacent villages are in a prosperous condition, and possess large numbers of cattle, sheep, and goats, as well as extensive tracts of cultivated land. In addition to the foregoing brief notes, Captain Harrel is stated to have obtained much valuable information relating to the objects of his mission, one of which was to ascertain how far the tribes he visited could afford to contribute towards the maintenance of the protection they had asked for from our Colonial authorities.

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* "Liemba," Mr. Hore remarks, is merely the Kilungu for "lake," and he retains it out of respect to Dr. Livingstone.

M. Revoil's Second Expedition to Somâli-land.—The Paris Geographical Society have received intelligence from M. G. Revoil, whose account of his former expedition in Somâli-land has already been

noticed,* that he intended to start from Aden c
Maraya in the country of the Mijjertain tribe. I
there two months, and to study the fauna and fl
From Maraya he will direct his course towar
plateau of Karkar, in the interior of the country,
during the rainy season, at which time it would
southwards to the country of the Dalbohantes
quence of the immense lake and unhealthy m
overflowing of the Nogal. M. Revoil has engage
Somâlis at Aden, and has sent to apprise several
of his intended visit, by the natives who had b
their cattle at the Aden market, and from whom
some information regarding the country he
M. Revoil expresses his indebtedness for valuab
Associate, Major F. M. Hunter, the Political Resi
mentions, is at present engaged in the pre
grammar.

The Indian North-West Frontier Question.—
new Indian north-west frontier is coming to th
presumptuous on our part to express a hope that,
to a large extent a geographical one, the surveyo
be consulted as well as the strategist. Already
asserted by a correspondent in the columns of the
rity of an eminent tactician and military critic, th
passes by which an invading army can advance o
suppose it is intended to refer to the Khaibar, Kur
We may observe, in passing, that one of the la
that ever crossed the Indian frontier advanced ag
by a totally different and much more direct ro
Sanghar Pass. But apart from that, we may prof
the opinion of one of the highest—we may perh
authority on the topography of Afghanistan. Spea
Geographical Society on the 28th February, 187
gregor said that he had collected data regarding
important military routes leading from Afghanis
which the Government did not possess sufficient
them to form a sound opinion. He also added
Afghanistan for the purpose of advancing on I
enter by the Bolan (in spite of the fact that ou
concentrated not in Sind but in the Punjab), bec
sufficiently well known. And yet in the list re
less than six other routes mentioned which are pr
any one respect to the Bolan. Geographers m
excused for suggesting that in a region so imp

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* Vol. i. p. 805, and vol. ii. p. 393.

demarcation of a new frontier should be preceded, if not by actual survey, at all events by a careful examination of the geographical materials already collected by the Indian Survey Department.

Colonel Tanner's Survey of Gilgit.—Major (now Colonel) H. C. B. Tanner's survey-map of Gilgit and the surrounding country has just reached England. It fills up a goodly portion of a sheet representing a degree each way, and the details are carefully plotted on the scale of four miles to the inch, thus admitting of easy incorporation into the Atlas of India, which is on the same scale. The tract surveyed extends from Bunji or Bowanji on the Indus, close to the confluence of the Astor River, up the valley of the Gilgit to Hopar (i. e. "the hole") on the Yasin frontier. Besides this, a large number of tributaries flowing down from the watershed to the south, dividing the Gilgit from the Darel and Tangir valleys, have been mapped, as well as the basin of the Hunza River and its tributary streams, almost up to the line of great peaks which marks the north-western section of the Karakoram or Muztagh chain. Major Tanner complains that he was most unfortunate in regard to weather, as he had only one clear day when on a mountain top. The country to the north was easier to survey than that to the south, the watershed before referred to (between the Gilgit and Indus rivers), in spite of its great height, which averages 15,000 or 16,000 feet, being peculiarly difficult to map owing to the absence of peaks along its length of 150 miles, and to the fact of the whole ridge forming a huge broken table-land. The entire area mapped amounted to about 1800 square miles surveyed on the $\frac{1}{4}$-inch scale, and a margin of 800 square miles of sketchy reconnaissance. Eight new trigonometrical stations were observed in all, and numerous heights were determined by aneroid and Marriotti's pocket mercurial barometer, which latter instrument gave very correct and satisfactory results. Colonel Tanner's work has not yet been connected with the route surveys of the Mullah in the Swat and Kandia valleys, and as another season would enable this geographical desideratum to be accomplished, it is much to be hoped that advantage may be taken of the presence of our Resident at Gilgit to sanction it.

Prejevalsky's Expedition: Visit to the Upper Hoang-ho. — The 'Invalide Russe' publishes further letters from Colonel Prejevalsky, giving an account of his journey to the Upper Hoang-ho, or Yellow River, after his return from the Tibetan plateau. The following is their tenour:—

HOUI-DÉ-TIN, PLATEAU OF THE HOANG-HO, *May* 1880.

After concluding affairs at Sining, I returned to my camp, 25 versts (13 miles) from the town of Tonkir. Having packed and despatched all our collections to Ala-shan, on the 20th March we directed our course to the Hoang-ho, 83 versts (55 miles) from Tonkir. The Yellow River here makes a sharp bend from north-east to east. At the place where the river turns is the little valley of Gomi, inhabited by bank of the Churmysh, which has a width of 300 to 350 feet at this place; besides which, the other bank presents the same difficulties owing to its abrupt and uneven nature.

Taking everything into consideration, I found it best to return to Gomi. Thence I repaired to Houi-dé, situated 60 versts (40 miles) off on the south bank of the Yellow River. Our interpreter, a Taránchi from Kulja, a very intelligent man and thoroughly reliable, was sent to Sining to notify to the local authority our wish to reach the mountains covered with eternal snows on our way through Houi-dé. The amban of Sining, believing that we were returning to our country discomfited by our misadventures, got into a fury on receiving this news, and declared that in conformity with instructions from Peking, he would not allow us to cross to the right bank of the Hoang-ho. He softened down, however, and ended by sending us a guide, charged with a communication in writing, in which he explained that he could not possibly let us go to Koko-nor, nor penetrate further into Houi-dé, where the Tangutans were in revolt. The whole story was a pure fiction in all probability. For my part, I do not count upon going beyond the snow-line of Houi-dé. I shall pass June there and explore its fauna and flora, afterwards proceeding northward towards Cheibsen, where I shall remain during the whole of July, in order to complete my previous explorations in these mountains.

The weather is detestable; it rains every day. There is snow in the mountains; in the night of the 10th–11th May the thermometer fell to 12° below zero. But the mountain flora is rich, and we have collected 250 kinds of plants. We have, moreover, caught many fish in the Hoang-ho, and prepared upwards of 500 specimens of birds. Besides these results of our travels, we have made a map of the countries visited, taken astronomical, barometrical, and thermometrical observations, and sketches of different types of natives. In a word, our explorations have been as complete as possible.

I could not penetrate to the sources of the Yellow River, but this can only be done by passing through Tsaidam and Tibetan territory. I have great doubts if the Hoang-ho makes so sudden a bend in its upper course as usually represented on maps. I can affirm that no such bend exists in the 250 versts (167 miles) of it which I have explored.

These are the succinct details which I can give as to our two months' journey up the Hoang-ho. I must confess that we were far better off with the Si-fan savages than among the Chinese. There is no end to the tales got up to our prejudice in order to excite the distrust of the people against us. As an example, the amban of Sining asked our interpreter if it were true that I could see 280 feet into the earth and discover precious stones there. The Si-fan firmly believed that we were sorcerers who could transport ourselves every night whither we wished, and that the only obstacle to our crossing mountains was the impossibility of carrying our mules and horses with us in our flight. The same amban of Sining related that Count Széchényi had obtained from the bottom of the Hoang-ho a precious stone of priceless value. Fairy tales indeed!

I shall pass July in the mountains of Cheibsen, and proceed thence to Ala-shan, which I count upon reaching towards the 20th August.

The foregoing continues the narrative of Colonel Prejevalsky's proceedings after leaving Sining, to which place we followed him in the note published in our September number (p. 566). From the particulars now given we learn that on leaving Sining Prejevalsky again turned southwards till he struck the Hoang-ho at Gomi, about 50 miles from Tonkir. A place of this name (spelt Homi) appears to have been visited by Marco Polo, if Colonel Yule's identification be correct;* but beyond the similarity of the name, which is striking, it can have but little to do with Prejevalsky's Gomi, for Polo's Homi (Anin) is in the province of Kweichau, south of the Kinsha-kiang, in lat. 23° 40′, i. e. nearly 13° south of the probable position of the Gomi in Kansuh mentioned by the Russian traveller. In the absence of more explicit details from him, we can but hint at some of the places likely to have been visited. Thus the great Lama monastery of Denger lies on the first day's march out of Sining (according to a Chinese itinerary translated into Russian by M. Uspensky†). This was in 1727 a great trade centre for all the Mongols living west of the Yellow River, and it would be highly interesting to know more of its present condition. Sining and Tonkir (Huc's Tang-keu-eul) were also flourishing cities in comparatively recent times, before the Mahommedan rebellion in Western China. Of the siege and recapture of the former of these places by the Chinese troops in 1872 Prejevalsky himself gives a humorous account in his earlier work.‡ Sining has long been noted as the centre of the rhubarb districts, and before leaving this subject it may interest some of our readers to learn that plants of the medicinal rhubarb propagated from seed brought by Prejevalsky from Kansuh in 1874 have attained a very respectable growth in the Botanical Garden of St. Petersburg, where the writer chanced to see them as recently as last month. The natives are spoken of as Si-fan. This is the name (signifying western barbarians) applied by the Chinese to the Eastern Tibetans.§ Cheibsen, which the traveller proposed visiting in July, is doubtless the Chobsen of his earlier work.‖ We must, in conclusion, repeat the regret once expressed by M. Uspensky (in a footnote to the above-mentioned Chinese itinerary, p. 300), that the sources of the Yellow River are still unvisited, and thus many highly interesting geographical problems are left unsolved.

Korea.¶—A correspondent of a Yokohama paper, writing from Korea, furnishes a few notes respecting the new port of Gensan, on the west coast of the peninsula, which the Japanese have succeeded in opening to their trade under the recent treaty with Korea. The distance from Fusan, on the south coast, where the Japanese have had a small settlement, chiefly for the Tsushima trade, for some 300 years, is stated to be about 184 *ri* (447 miles). Gensan is situated on a vast plain, and in a very favourable position; its harbour is large and picturesque in appearance, and infinitely superior to that of Fusan. The Japanese settlement, which has an area of about 83 acres, is already partly occupied, and the building of a Consulate is nearly completed. The principal productions of the neighbourhood are gold, silver, leather, bones of horses and bulls, grain, fish, and seaweed, gold being described as especially abundant in this part of Korea.

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* Yule's 'Marco Polo,' 2nd edit. vol. ii. p. 214. G and H are expressed in Russian by the same letter. In the present instance the 'Journal de St. Pétersbourg,' from which the above is taken, has rendered this letter by the Roman G.

† 'Isvestiya' of Russ. Geog. Soc., 1873, vol. ix. p. 298.

‡ 'Mongolia,' English ed. translated by E. D. Morgan, vol. ii. p. 134.

§ Op. cit. ii. 302.

‖ Op. cit. ii. 70 *et seq.*

¶ Cf. vol. i. p. 793.

The Coast of Russian Manchuria.—The same correspondent of the 'North China Herald,' to whom we were indebted for the remarks on Russian Manchuria at page 567, in a further letter furnishes some interesting notes on the coast north of Vladivostock. After the straits and island of Askold, on which is a valuable gold-mine, have been passed, the course diverges more to the north, skirting the coast, which is bold and presents a picturesque variety of mountain, hill, plain, and valley, for the most part richly wooded, while the villages of the seaweed collectors are dotted along the beach. From Cape Disappointment to Barracouta Harbour there is a long stretch of unknown coast, presenting very similar features to that further south, and devoid of prominent landmarks. At Castries Bay, where vessels call to obtain pilots for the Amur, a military road runs across the isthmus, communicating with the principal branch of the Amur, some 40 miles distant. Twenty miles above Castries Point, the north cape of the bay, the intricate navigation begins, and the voyage up the river to Nikolaiefsk is rendered the more difficult by the constant shifting of the channels, due to the debris brought down by the strong current of the Amur. The Russians are said to intend removing the settlement of Nikolaiefsk, which was abandoned as a great military station some time back in favour of Vladivostock, to a point nearly 700 miles further up the river, probably owing to the severity of the climate in its present locality, caused by its proximity to the Sea of Okhotsk. Forests extend as far as the eye can reach on either side of the river at Nikolaiefsk, and contain many unknown treasures for the botanist and the naturalist. The soil in the neighbourhood is described as clayey, overlying beds of lava and trachyte, and the water is impregnated with lime. Smoked salmon, caviare, and leather, tanned with birch bark which gives it the well-known smell of Russia leather, are among the staple products of the place. The Gilyaks,* a Siberian tribe, manufacture about here very curious waterproof dresses from the skin of the salmon, which look like shot silk, when new. The convict station at Dui, in Saghalien, is a place of some interest; the harbour is formed by a gentle curve in the land, with a bold cape at each extremity; and the shore is lined by lofty cliffs of ironstone and limestone, with seams of coal at an angle of about 30°. The island promises to be a valuable acquisition to the Russians, as timber, coal, iron, sea-weed, whales, and

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* Cf. *ante*, p. 644. In the letter referred to above, the following passage occurs:—"The Gilyaks, in common with most of the Siberian tribes and the Ainos, keep caged bears in their villages, over the killing of which there is an annual festival." Perhaps the practice here alluded to may account for Mr. Lansdell's statement that "they are commonly said to worship the bear."

seals, sables, and other fur-bearing animals are
and the soil is capable of growing anything.

The Aboriginal Tribes of Western China.—A
aborigines of Western China is but scanty, Mr.
Inland Mission, has done good service in sending
personal observations of the Lo-lo tribes, who in
trict in the Szechuen province, west of Su-ch
southward into Yünnan. The Lo-lo men he de
so stout as the Chinese are in many instance
darker, and their features sharper and better loo
them shave their heads after the Chinese fashion,
hair, but wear it in a number of little twists or
into one, and made into a knot on the front of th
long narrow strip of calico round their heads, the
is bound round the knot of hair, and makes it loo
protruding from the forehead. Many of those see
what lazy in their habits; but as they have a l
under cultivation, some of them must work.
and they live in low smoky houses, with little or
inside or out. They seem fond of tobacco, bu
though Mr. Nicoll fears that they are inclined t
In Ning-yüan-fu the Lo-lo have assimilated the
adopting their dress in full, and many of them h
and military degrees, and have in consequence r
ments among their own people. The Lo-lo wom
and skirt; the latter is plain from the waist d
for about a foot or fourteen inches it has seve
which is another plain piece about four inches
than the rest of the dress, so as to allow freedo
coming to within two inches of the ground. Th
shoulders, and comes down loose to the waist.
dress is the stiff band worn round the neck, wh
of a soldier's stock; it is beautifully embroider
back with a silver clasp. These Lo-lo inhabit
the hills are in many places covered with deep
Their mode of farming is different from that
Mr. Nicoll says ' they seem to follow in the wa
farmers, although very far behind them." Their
maize, beans, and potatoes. They have large nu
and sheep, the last not having the fat tail of the

The Upper Uruguay Valley as a Field for C
Beschoren invites attention, in a recent issue (No.
of the Berlin Geographical Society, to the exce
colonisation offered by the South Brazilian plat

the rivers Ijuhy Guassu and Passo Fundo, southern tributaries of the Uruguay River. The country consists partly of highland, and partly of rich slopes gradually descending to the bed of the Uruguay River. Metals are known to exist, the old Jesuit missions having worked gold, silver, and copper mines, and a resident of Palmeira a few years since having brought back from the region referred to unmistakable evidence of mineral wealth in the shape of a bag of gold-dust. There are fully 10,000 square kilometres of virgin forest available for intending settlers, the araucaria pine (*Araucaria brasiliensis*) and the Paraguay-tea tree (*Ilex paraguayensis*) being exceptionally abundant; while other forest growth of economic importance is well represented. Frost, snow, and ice are not unfrequent on the highlands, but are unknown in the valleys of the Uruguay and its tributaries. At a place called Nonohay in the Passo Fundo valley, the author saw tropical products such as coffee, sugar, mandioca, and tobacco, side by side with maize, beans, and potatoes. The natural advantages of this country are described as superior, for the purposes of European colonisation, to any other part of Brazil.

The Argentine Pampas.—We are informed by Dr. Stanislas Zeballos, the President of the Argentine Geographical Institute, that he returned to Buenos Ayres in February last from a journey of exploration in the Argentine Pampas, which afford a refuge to the most important groups of the indigenous Araucan race, and that he has in the press a work on the subject of the expedition. During the three months that he was absent on this frequently dangerous journey, he travelled 900 miles, and discovered rivers, mountains, lakes, and numerous features in the country which are new to geography. The importance of these discoveries will be shown by the many corrections, to which they will give rise, in the map of South America in the region comprised between 35° and 40° S. lat., and 61° 40′ and 69° 40′ W. long. Besides the material furnished by his field book, Dr. Zeballos has collected much information of interest in the departments of geology, anthropology, hydrography, botany, and zoology. He tells us, in conclusion, that the Pampas are by no means an immense level plain, as they are commonly supposed to be, but on the contrary contain majestic scenery, as well as many unexpected and interesting features.

The Climate of the Falkland Islands.—A correspondent recently furnished the 'Times' with a long communication on these islands, dealing more particularly with the unsurpassed advantages they offer to a limited number of emigrants with small capital, but he adds some remarks on the subject of their climate and products, which are of wider interest. All the islands lie between S. lat. 50° and 55°, and resemble the Orkneys in climate, soil, and vegetation. The thermometer ranges from 26° F. to 50° F. in winter, and from 50° F. to 75° F. in summer. Snow

Sind frontier, and in 1856, on the breaking out of the war with Persia, the late General Jacob being directed to take command of cavalry of the expeditionary force, Sir W. Merewether remained in charge of the Sind frontier, and to his admirable conduct in that position during the most trying times of the Indian Mutiny may be attributed the order maintained upon that border under exceptionally difficult circumstances, as well as in a great measure the peace of the whole province of Sind. But the constant anxiety and strain on his constitution which the state of affairs had required, compelled him, on the return of General Jacob, to seek relaxation in England; he was however recalled in a few months on the lamented death of that distinguished soldier and administrator, which occurred at the latter end of 1859, when Sir William Merewether assumed his command, which he held until required to undertake the duties of military secretary to the government of Bombay in 1861. From this he was transferred to the political charge of Aden, where by his administrative ability he brought under control many of the Arab tribes located in the surrounding country. During the Abyssinian war Sir W. Merewether was appointed to the command of the cavalry attached to the force, but this position he never took up, acting throughout in a political capacity. He was at the close of this war offered and accepted the commissionership of the province of Sind, which he held until he returned to England and took his seat in the council of India. He was enrolled a Fellow of our Society in 1868, and since May 1878 had served as a member of the Council.

Sir William Merewether possessed considerable natural ability, and was endowed with sound common sense, great tact, judgment, and temper, and the most indomitable perseverance in the carrying out of any work he undertook to perform. Of a robust constitution, he was extremely fond of all field sports, particularly of hog-hunting, while his kind, genial, chivalrous, and generous disposition endeared him to all, and few men have left more numerous and sincere friends to mourn their loss.

The Reverend George Maxwell Gordon, M.A., who was killed at Candahar on 16th August last, was the younger of the two sons of the late Captain J. E. Gordon, R.N., sometime M.P. for Dundalk, and of Barbara, daughter of Samuel Smith, Esq., M.P. for Herts.

He was born in 1839, and graduated at Trinity College, Cambridge, in 1861. In 1866, after a visit to Palestine, he went to India as a missionary of the Church Missionary Society. He there worked, first around Madras, then in the Punjab, both in the Lahore Divinity College, with the Rev. T. V. French, now Bishop of Lahore, and as an itinerary missionary, with Pind Dadan Khan as his head-quarters.

In 1870 he travelled in New Zealand and Australia. He afterwards declined the offer of a Bishopric about to be founded in the latter country. After a short visit to England, he returned to India in 1871, through Persia, where the famine was then raging, and remained there for some time dispensing aid to the sick and starving, at Ispahan and Shirez. In 1874 he worked at Jhelum, and in 1878, with the sanction of the Government of India, marched to Quetta with Sir M. Biddulph's column. He thence went to Candahar with the troops, returning to Pind Dadan Khan. He subsequently started the Biluch Mission at Dera Ghazi Khan, returning to Candahar, where he again undertook the duties of Acting Chaplain to the Forces. During the sortie on 16th August last he received the wounded in the hospital as they were brought in; but subsequently, when returning from bravely visiting some wounded men in a shrine 400 yards outside the gate, alone, under a heavy fire, he was shot through the wrist and side, and died the same day.

He was elected a Fellow of the Royal Geographical Society in 1879, and was for fifteen years a missionary of the Church Missionary Society at his own cost.

CORRESPONDENCE.

On a possible Communication between Skyring Water and Smyth's Channel leading to the Pacific.

Fernacres Farm, Fulmer, Slough,
Aug. 25*th*, 1880.

When you called my attention to Mr. Coppinger's letter giving an account of his visit to Skyring Water in the Straits of Magellan,[*] I said I would send you a few remarks with regard to the channel supposed by that gentleman to be possibly existent from Skyring Water northward or westward, as I felt sure the matter had been settled by FitzRoy.

On referring to the 'Voyages of the *Adventure* and *Beagle*,' I find that it was on the authority of Mr. Low [†] that the head of Skyring Water was sealed up from the west side; but Skyring himself decided the question from the north. It is evident from his description [‡] that he expected Obstruction Sound would be found open to the south-east, and he went on from disappointment to disappointment, though the channels narrowed so much that they could have been of little practical value. After passing "Up and down" Cape, at the bottom of one bight he observed—I quote his own words—"distant high land in that direction (south-east), and could see a sheet of water about six miles from me; but whether it was a lagoon or a part of the Skyring Water was doubtful." He then went on to Hewitt Harbour, and says, "on the following morning we pursued our course to the S.S.W., and at eleven o'clock reached the extremity of this extensive sound. All our suspense was then removed, and all our hopes destroyed; for the closing shores formed but a small bay in the south-west, and high land encircled every part without leaving an opening."[§]

He excuses himself for unnecessary diffuseness in his description of this examination, and goes on to say, "but I think that when its near approach to the Skyring Water is known by others, it will be considered very singular that no communication exists between them. . . . To every one on board the *Adelaide* it was a great disappointment." He describes the examination by Kirke and himself of "the only inlet now remaining to be explored," which was to the S.S.E.; and of one to the north-east which Kirke had left undone, and "which, as our last hope, I thought it necessary to examine." And he adds, to show how alive he was to the "very singular" consideration above mentioned, "situated as we were, we had great reason to be very earnest in the search for a passage; and I think that no channel into the Skyring Water, however small and intricate, would have been left unattempted at this crisis."

It seems to me that this testimony is quite conclusive, and I think you will be of the same opinion. It is evident that no stone was left unturned to find the hoped for and expected channel. I will only add that if you examine the chart you will see that such a passage could not be of practical value for vessels. The navigation, especially through FitzRoy Channel, is much more intricate than by the regular channel; and the distance, if a vessel came out into Obstruction Sound, would be greatly increased. Even if a ship could go straight through—which it cannot—from the head of Skyring Water to Clapperton Inlet, the distance from St. Jerome Point (Crooked Reach) would be 50 miles longer than that by Cape Tamar.

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[*] Published in the 'Proceedings,' September number, p. 552.

[†] Mr. Low was the master of a sealer well acquainted with all these places, and from whom FitzRoy got much information.

[‡] 'Narrative of the Surveying Voyages of H.M.S. *Adventure* and *Beagle*,' by Captains King and FitzRoy, vol. i. p. 346 *et seq.*

[§] Op. cit., p. 351.

RICHD. C. MAYNE, Rear-Admiral.

C. R. Markham, Esq., C.B., Secretary R.G.S.

Observations made during a recent Voyage along the Loango Coast of West Africa.

25 CAMDEN STREET, N.W., *8th October*, 1880.

DEAR SIR,—Having just returned from a cruise on the West Coast of Africa, I beg to forward you a few extracts from my log, which perhaps may deserve to be brought to the public notice.

Steaming along the coast to the northward at 5 P.M. on the 25th July, 1880, in lat. 6° 38′ S. and long. 12° 25′ E., at a distance of seven miles off the land, and during a heavy "calemma" (rollers), I saw 1½′ to the eastward heavy breakers; the water jumped up at half a dozen different places as if jerked out of a submarine volcano. This was a shoal evidently composed of rocks; its position coincides with the position of a shoal marked as doubtful in the Admiralty charts, and about 6′ S. by E. from the Vesuvius shoal. Its rocky bottom makes it evidently very dangerous to navigation.

On the 31st of the same month, in lat. 4° 24′ S. and long. 11° 37′ 30″ E., I discovered the mouth of a river not marked in the Admiralty charts, and called Yumbo by the natives. It is over 100 feet wide, and its depth varies from four to 16 feet, according as its mouth is shut or open. It shuts during heavy "calemmas" (rollers), and opens again when the current overcomes the obstacle thrown up by the sea. This river is said to extend a long way into the interior, and there is a considerable native traffic on it. 1¾ mile to the northward, I found another river, called Kissao by the natives; it is much smaller than the Yumbo, but its mouth is also subject to the same variations.

In August I visited the Bay of Chillongo. The reef off Chillongo Point extends 4′ in a N.W. by N. direction, and breaks during calemmas; it should not be approached nearer than nine fathoms, as the sea outside the reef is said to break in seven fathoms during heavy calemmas. The reef is composed of sand and rocks, and is very dangerous. There is a channel for small craft between Chillongo Point and the reef, said to carry three fathoms.

Coming from the southward, pass the mouth of the Chillongo River (which is not in the bottom of the bay, but five miles further in a N.N.E. direction), and the light-coloured hummock at the back; then steer for a dark bluff at the water's edge until Chillongo Point is in one with an easily distinguished point 4′ to the southward of it; being now well inside the reef, haul to the southward and go as far into the bottom of the bay as desirable, four fathoms being a good anchoring ground a long way in. It does not break inside the bay during heavy calemmas even, as the reef forms a natural breakwater.

While writing about the South-west Coast of Africa, I may as well mention that the 1¼ fathom patch in Corisco Bay, in lat. 1° 3′ N. and long. 9° 30′ E., does not exist.

By bringing an easily distinguished clump of trees on north-west point forming

Kábul, including the Karappa'h and Tahtarah routes, and various others both from Kábul and Pes'háwar, extending from Káfiristán to the Abáe Sind.

Independently of the general value of these notes at the present time from the special linguistic attainments of their author, a great amount of geographical and topographical information is contained in them, which is in all difficult points lucidly explained, the errors of former authors being pointed out and amended.

Röhricht, Reinhold, & Meisner, Heinrich.—Deutsche Pilgerreisen nach dem heiligen Lande. Berlin (Weidmann): 1880, 8vo., pp. 712. (*Williams & Norgate:* price 1*l.*)

After an historical introduction, the accounts of twenty-three German pilgrims to the Holy Land are reproduced with annotations, from Jacob von Bern, in 1346, to Ernst von Bueseck, in 1587. A Pilgrim roll from 1300 to 1600 follows, and the work concludes with a bibliography, glossary, &c.

AFRICA.

Debaize, Michel-Alexandre.—L'Abbé Debaize et sa Mission Géographique et Scientifique dans l'Afrique Centrale. Par Alfred Rabaud. Marseille (Barlatier-Feissat): 1880, 8vo., pp. 68, photograph.

The President of the Marseilles Geographical Society has here collected from the numbers for April, May, and June last of the Bulletin of that Association, various particulars concerning the appointment as an explorer, under the auspices of the French Minister of Public Instruction, and the progress of the late Abbé Debaize, whose death at Ujiji, from dysentery, on the 12th December, 1879, at the early age of thirty-four, added another promising life to the long list of pioneers who have succumbed to the dangers of African exploration.

Silver, S. W., & Co.'s Handbook to South Africa, including the Cape Colony, Natal, the Diamond Fields, the Transvaal, Orange Free State, etc., also a Gazetteer and Map. Third edition. London (Silver): 1880, cr. 8vo., pp. 576, map. Price 5*s.*

Important changes and additions have been made in the revision of this work, in order to bring its information to the latest date. The map has also been revised with care, and corrected to the present time.

AMERICA.

Acosta, Joseph de.—The Natural and Moral History of the Indies, by Father Joseph de Acosta. Reprinted from the English translated edition of Edward Grimston, 1604, and edited, with Notes and an Introduction, by Clements R. Markham, C.B., F.R.S. Vol. ii. The Moral History (Books v., vi., and vii.). London: printed for the Hakluyt Society (Richards, 37, Great Queen Street, W.C.), 1880: 8vo., pp. i.–xiii. and 295–551.

Forms No. LXI. of the Hakluyt Society's publications, and completes the work noticed in the present volume of 'Proceedings,' p. 459. A copious Index is given.

Eden, C. H.—The West Indies. London (Sampson Low & Co.): 1880, cr. 8vo., pp. 239, map, illustrations. Price 3*s.* 6*d.*

A generally descriptive compilation, including geography and history.

Lista, Ramon.—Exploracion de la Costa Oriental de la Patagonia, bajo los auspicios del Gobierno Nacional. Buenos Aires (Biedma): 1880, sm. 8vo., pp. 67, pl.

The author, whose various publications on Southern Patagonia have been noticed in our 'Proceedings' on former occasions, was officially sent in February last to make some explorations on the eastern coast, with the object of discovering a land communication between the Rio Negro and the Colony of Santa

Cruz, *viâ* San Antonio and the Chubut. At the
made to San Javier and other points of the valle
the view of determining the agricultural capabilitie
considerable (at all events between Viedma and
subject to inundations arising from the melted s
navigability of the Rio Negro also formed a subj
be accessible for steamers of light draught as far as
point its excessively tortuous course renders a land

Señor Lista describes Viedma and its neighb
from that town to the Lake of Gutierrez, to whic
by the vicinity of hostile Manzanas Indians.
physical features of the points on the Atlantic coa
of San Antonio, and makes a special report on B
list of the mammals, birds, reptiles, mollusks, and
explorations.

Markham, Clements R.—Peru. London (Sampson
pp. 192, maps, illustrations. Price 3*s.* 6*d.*

This and Mr. Eden's work above named belong
tive of the principal countries of the world ('F
Colonies'), each country being treated of by a writ
ledge is qualified to speak with authority on his sub
of Mr. F. S. Pulling.

The present volume, after a general descripti
chief features of the physical geography, geology,
Peru, its people and their languages, architectura
list, pp. 85 and 86, of all now existing, including t
rities who have described them), provinces and tow
public works, government, education, and literatur
political and physical aspects of the country.

Rockstroh, Edwin.—Informe de la Comision Cientif
Guatemala, nombrada por el Sr. Ministro de Instruc
de los Fenómenos volcánicos en el Lago de Ilopango
Guatemala (Tipografia de 'El Progreso'): 1880, 8vo.

The occurrence of some very curious recent
Ilopango, induced the Government of San Salva
present year, to authorise a special commission
locality. Professor Rockstroh, Sub-director of
formed one of the party, and in this report h
geography of the volcanic region of Southern G
journey to Santa Tecla, or New San Salvador, sou
same name, and finally to the capital of the
Ilopango, the Commission was established at Apu
from which locality they embarked for the volca
distance of 200 metres from the volcanic rock, th
was from 37° to 39° centigrade; from that point
45° at 100 metres distance, giving off clouds of v
50° centigrade near the volcano itself. The elevat
the sudden development of intensely thick steam
retreat from the centre of volcanic activity, after
stones from the most conspicuous rock of the
enough were not found to be warm. Visits wer
destruction caused by the earthquakes of the preced
to the peak of Cuxcux, between Analco and San
ramic view from which is described as of excessive
volcano of San Salvador. The crater of this mo
travellers struggled for three hours against the
explorations in an attempt to descend its inner
only accessible at one spot, and containing water

sulphuretted hydrogen than Lake Ilopango. At the highest point (1879 metres), an accidental dispersal of the enveloping clouds revealed to the adventurous travellers a splendid sight of the whole terrain, so highly interesting to seismologists.

The personal narrative is followed by a minute descriptive account of Lake Ilopango, which occupies a considerable cleft between the two volcanoes of San Salvador and San Vicente, 486 metres above sea-level, and of its fishes (of which two species are identified as belonging to the genus *Heros*, abundant in the lakes and rivers of Central America). These were once so plentiful as to form a staple article both of commerce and of food for the neighbouring people, being easily captured in large quantities by hand, even by women and children, on the frequent occasions when the excessive impregnation of the water by sulphurous gases drove the fishes to the shore in a semi-asphyxiated condition. The recent volcanic disturbances, however, resulting in an elevation of the temperature of the water and of its sudden lowering in level, have put an end to this industry, innumerable quantities of fish having been suddenly left on the shores, to such an extent that at Asino some hundreds of men had to be employed for many days in burying them in order to prevent epidemics arising.

The valley of San Salvador and the places near Ilopango are also described, followed by an account, chronologically arranged, from the earliest historic date, of the various earthquakes, &c., recorded, with special tables on those of December last, giving dates, times, forces, &c. Details are also given of the various alterations in the level of Ilopango, and of the appearance and rocky composition of a new and active volcano in the lake, the formation of which is believed by some to be likely to put an end to the local volcanic disturbances—an opinion not shared by Professor Rockstroh.

The Report concludes with some meteorological observations and a table of elevations. The map shows Lake Ilopango (scale 1¼ mile to the inch), with depths, &c.

AUSTRALASIA AND OCEANIA.

Forrest, Alexander.—1880, Western Australia, North-West Exploration. Journal of Expedition from De Grey to Port Darwin. Perth (Pether): 1880, fo., pp. 43, 8 pls., map.

This Government Report (marked No. 3) contains in diary form the details of the expedition of which notices have from time to time appeared in our 'Proceedings' (see number for February last), from the start on 25th February, 1879, at De Grey River Station, to the arrival in the following October at Palmerston, the capital of the northern territory of South Australia.

Mr. Forrest believes that some 25,000,000 acres of pastoral and agricultural land, mostly in Western Australia, and hitherto unknown, have been opened up by this journey. The country round Beagle Bay, where the real exploration commenced, and thence to the Fitzroy, is considered especially adapted for settlement; the bay itself having good anchorage and harbour, and containing good sites for a township. The land for from 10 to 30 miles back on each side of the Fitzroy, from its mouth to 17° 42′ S. lat. and 126° E. long., was found well grassed and suitable for stock-raising, though liable to floods from December to March, necessitating removal five miles back to the high lands. The river itself apparently presents no obstacles to navigation by small steamers for at least 100 miles from the sea; its mouth, however, was not examined. Very rough and hilly country then follows, between the Fitzroy and the coast at Secure Bay, at the foot of the Great Barrier Range, but it improves as the Range is left, and is grassed to the summit. Secure Bay itself is almost land-locked, with a tidal rise and fall of 30 feet, and well supplied with fresh water from running springs.

Numerous rivers and running streams were found in the large extent of well-grassed open country traversed from the Fitzroy to the boundary of the colony, which is considered to be a continuation of Gregory's "Denison Plains"; and this area is apparently not subject to the periodical inundations so prevalent near rivers in tropical Northern Australia.

The natives were invariably friendly, and many of them wore pearl ornaments, suggesting the probable occurrence of pearl-shell banks between Beagle and Collier Bays. Luckily for the explorers, who were subject to the usual personal straits of Australian travel, fish, birds, and other game were found in some plenty during nearly the whole of their journey.

Mr. Fenton W. Hill, who accompanied the party, makes two brief geological reports, with no particular result, except as proving the absence of auriferous rock, the primary object of his search. The hope of minerals is, however, not abandoned, as the formation beyond the ranges which stopped the progress of the party towards the Glenelg had all the appearance of containing gold.

The illustrations accompanying the Report are in lithotint, and show the arrival at the Fitzroy and its emergence from sandstone ranges to alluvial plains, the St. George and Leopold Ranges under various aspects, and the Devil's Creek in the latter range, &c. The map (scale, 35 miles to the inch) gives the route in detail from Nickol Bay to the Overland Telegraph line, with smaller insets of a general and geological character; it is also accompanied by a route-description of the country between the De Grey River and Katherine Station.

Giles, Ernest.—The Journal of a forgotten Expedition. Adelaide (W. K. Thomas & Co.): 1880, 8vo., pp. 26, map.

An account of the author's third exploring expedition, in 1875, in South-western Australia, reprinted from the 'Adelaide Observer.' Starting at Yallata, Fowler's Bay, South Australia, Mr. Giles, after visiting Eucla on the boundary line of Western and South Australia, struck north from Colona, but did not get further than Youldeh, from which depôt, after a vain search for water to the west, he turned eastward to Wynbring, the furthest point known to his native guide. No water was found beyond this place, and at 168 miles to the east of it, the last of the horses belonging to the expedition died. The party however struggled on, until on the eighth day and at a distance of 220 miles from Wynbring, water was first found near the west side of the northern extremity of Lake Torrens. From this point, the party turned north to Finniss Springs, near the south end of Lake Eyre, reaching Beltana on the Overland Telegraph line, and finally arriving at Port Augusta with the camels in safety. Refitting here, Mr. Giles again started on a western expedition, his route lying between Lakes Torrens and Gairdner; striking his former path between Wynbring and Mount Ross, he reached Youldeh again by a northern circuit from Wynbring. These journeys were undertaken as preliminary to the author's subsequent expedition through the southern interior to Perth in Western Australia. The tracks are clearly shown on the map.

Hunnewell, James.—Journal of the Voyage of the *Missionary Packet*, Boston to Honolulu, 1826. Charlestown (privately printed): 1880, 4to., pp. 77, maps, plates.

Mr. James F. Hunnewell, of Charlestown, Mass., has here added another to the list of elaborately prepared works for which book collectors are indebted to American enthusiasts. It contains much of a purely personal nature, but is interesting as supplying details of the exact condition of the Sandwich Islands so far back as 1820, illustrated by a portrait from a very rare copper-plate of Kamehameha I., and a view of Honolulu from another very rare plate engraved in the islands in 1837. The log of the *Missionary Packet* supplies some notes on the Straits of Magellan, and is supplemented by a list of early passages from 1520 to 1620, illustrated by a reproduction of a plate from Von Bry, and of two maps from Jeffery's American Atlas, 1775.

Schmeltz, J. D. E., & Krause, R.—Die ethnographisch-anthropologische Abtheilung des Museum Godeffroy. Ein Beitrag zur Kunde der Südsee-Völker. Hamburg (Friederichsen): 1880, 8vo., pp. 650, map, pls. (*Dulau*: price 25*s.*)

—— Süd-See-Typen. Anthropologisches Album des Museum Godeffroy in Hamburg. Hamburg (Friederichsen): 1880, 4to., 28 photographs, explanatory text, and map. (*Dulau*: price 2*l.* 10*s.*)

Originally intended as a descriptive catalogue of the anthropological section of the well-known Museum Godeffroy in Hamburg, the first part of the above-mentioned work has so grown in extent and scientific importance during its preparation as to claim the title of a Handbook of Ethnography and Ethnology of the South Sea Tribes. Much valuable and hitherto unpublished geographical detail is given in it, originating mostly from special inquiries of the Museum travellers and collectors. It is arranged in geographical order, beginning from Australia. Each part begins with a more or less detailed description of nearly all the islands of the Pacific Ocean, exhibiting them from the view of the geographer as well as that of the naturalist, and ends with a detailed description of the ethnographical objects, with information relative to the literature, and important critical notes.

The Anthropological Album is to be considered as a supplement of this work; it is divided into three parts; Polynesia, Melanesia, and Micronesia, systematically arranged according to the groups of islands.

Silver, S. W., & Co.'s Handbook for Australia and New Zealand (including also the Fiji Islands), with new map of the Colonies. Third edition. London (Silver): 1880, cr. 8vo, pp. 449, map. Price 5s.

The information in this well-known Handbook is here brought down to the latest date, the statistical and other details having been corrected from the most recent returns from official and other authentic sources. Additions have also been made to the map, showing (as much as may be on so small a scale) the work of exploration and settlement of the interior, including the latest discoveries of A. Forrest and Winnecke.

GENERAL.

Gravier, Gabriel.—Les Normands sur la Route des Indes. Rouen (Cagniard, pro Maisonneuve): 1880, squ. 8vo., pp. 51. (*Williams & Norgate:* price 3s.)

An inaugural lecture before the Rouen Academy of Sciences, in which the author proposes to establish an amount of skill and knowledge in navigation on the part of the early Normans equivalent to that possessed by Columbus; and to fix the date of arrival of Norman sailors on the coasts of Brazil.

Hübner, Alexander von.—Ein Spaziergang um die Welt. Leipzig (Schmidt & Günther): 1880, 4to. (*Williams & Norgate.*)

To be completed in about 30 numbers, price 1*s.* 6*d.* each, copiously illustrated. Baron Hübner's journey was commenced so long ago as 1871. The journey from Queenstown to the United States forms the introductory portion.

Ménard, René.—Le Monde vu par les Artistes. Géographie artistique. Paris (Delagrave): 1880, large 8vo., maps, illustrations. (*Williams & Norgate.*)

To be completed in about 60 numbers, price 5*d.* each, or subscription to the whole volume 1*l.* Its aim is to exhibit the development of art in different parts of the world.

Wallace, Alfred Russel.—Island Life: or, the Phenomena and Causes of Insular Faunas and Floras, including a Revision and attempted Solution of the problem of Geological Climates. London (Macmillan): 1880, 8vo., pp. 526, maps, &c. Price 18*s.*

This work, considered by the author as a popular supplement to, and completion of, his 'Geographical Distribution of Animals,' entering more fully into specific details, is based on a theory that the distribution of the various species and groups of living things over the earth's surface, and their aggregation in definite assemblages in certain areas, are the direct results of biological and physical causes, each mainly of two kinds; the biological being the constant tendency to increase and occupy a wider area, and the laws of evolution and extinction; and the physical being geographical and (especially geological) climatic changes. In investigating the latter, the author concludes that, in all probability, periods of time less vast than have hitherto been thought necessary were required for their development and for other geological and organic

changes. Passing over the purely geological portion
the general conclusion that geographical conditions
great changes of climate, and that the radically diffe
and water in the northern and southern hemispheres ha
diversities of the Arctic and Antarctic regions.
combinations are also considered unable to produce
that of (say) 200,000 years ago, without the concurre
and as the present epoch is one of very low excent
corresponding phase of exceptional stability, both phy

These preliminary discussions occupy nearly half
cludes with somewhat minute descriptions of a serie
and faunas, the phenomena of distribution in which
base of arguments deduced in the first portion, with
the complete interdependence of organic and inorganic

NEW MAPS.

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Austrian Military Geogr. Institute.—Karte der U
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Price 3*s*. (*Dulau.*)

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to an inch. J. Kocher. Reutlingen. (*Dulau.*)

Dépôt des Fortifications.—Carte de France, feuille.
tions. Paris, 1880. (*Dulau.*)

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piled and lithographed at the Intelligence Branch,
Department. London, 1880.

Meyer, J.—Karte d. alten Nord-Frieslandes bis an das
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Petermann's 'Geographische Mittheilungen.' —
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Expedition 1878 und der Österreichisch-Ungarischen Po
bearbeitet und gezeichnet von H. Mohn, 1879. Sc

geographical miles to an inch. Petermann's 'Geographische Mittheilungen,' Ergänzungsheft No. 63, Tafel 1. Justus Perthes, Gotha, 1880. (*Dulau.*)

Contains the following inset maps :—Salzgehalt der Meeresoberfläche, nach H. Tornöe.—Stickstoffgehalt des Wassers am Boden des Meeres, nach H. Tornöe. —Salzgehalt am Meeresboden, nach H. Tornöe. Scale 1 : 40,000,000 or 547·9 geographical miles to an inch.

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—— Tiefen-Verhältnisse & Wärme-Vertheilung im europäischen Nordmeer. Nach den Messungen der norwegischen Nordmeer-Expeditionen, 1876–1878. Von H. Mohn. Petermann's 'Geographische Mittheilungen,' Ergänzungsheft No. 63, Tafel 3. Justus Perthes, Gotha, 1880. (*Dulau.*)

—— Ost-Rumelien's Administrative Eintheilung. Nach authentischen Quellen von Hugo Kutschera. Scale 1 : 1,600,000 or 21·7 geographical miles to an inch. Petermann's 'Geographische Mittheilungen,' Jahrgang 1880, Tafel 17. Justus Perthes, Gotha, 1880. (*Dulau.*)

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Petermann's 'Geographische Mittheilungen.'—Ethnographische Karte von Kaukasien. Von N. v. Seidlitz. Scale 1:3,700,000 or 50·5 geographical miles to an inch. Petermann's 'Geographische Mittheilungen,' Jahrgang 1880, Tafel 15. Justus Perthes, Gotha, 1880. (*Dulau.*)

AFRICA.

Holub, Dr.—Übersichts-Karte von Dr. Holub's Reisen in Süd-Afrika 1872–1879. Scale 1:7,200,000 or 98·6 geographical miles to an inch. Verlag v. Alfred Hölder, k. k. Hof- u. Universitäts Buchhändler in Wien.

—— Special Karte (No. 1) des von Holub bereisten centralen Theiles von Ost Bamangwato und West Matabele. Nach Compass Aufnahmen Juli 1875, u. März u. April 1876. Scale 1:500,000 or 6·8 geographical miles to an inch. Alfred Hölder, Vienna, 1880.

Kiepert, H.—Politische Uebersichtskarte von Afrika. Nach den neuesten Forschungen und Reise-Ergebnissen berichtet und ergänzt. Scale 1:20,000,000 or 273·9 geographical miles to an inch. Berlin, D. Reimer. Price 1*s.* 6*d.* (*Dulau.*)

Kiepert, Richard.—Deutsche Aufnahmen in Angola. Dr. H. von Barth's Reise 1876 im Gebiete des Bengo und Lucalla und Ingenieur Otto Schütt's Aufnahmen am unteren Quanza 1877–1879. Nach von Barth's Tagebüchern konstruirt und nach Schütt's Originalkarten gezeichnet von Richard Kiepert. Scale 1:600,000 or 8·1 geographical miles to an inch. 'Zeitschr. d. Ges. f. Erdk.', Bd. xv., Taf. 6. Berlin, Dietrich Reimer, 1880.

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Petermann's 'Geographische Mittheilungen.'—Provisorische Karte zur Uebersicht der Portugiesischen Expedition unter B. Capello und R. Ivens von Nov. 1877 bis Oct. 1879. Gez. v. B. Hassenstein. Scale 1:4,500,000 or 62·5 geographical miles to an inch. Petermann's 'Geographische Mittheilungen,' Jahrgang 1880, Tafel 16. Justus Perthes, Gotha, 1880. (*Dulau.*)

—— Originalkarte von Dar-Fur. Nach den Positionsbestimmungen und Recognoscirungen des Ägyptischen Generalstabs, 1876 u. 1877, entworfen von Oberst A. M. Mason-Bey, 1879. Scale 1:2,500,000 or 34·4 geographical miles to an inch. Petermann's 'Geographische Mittheilungen,' Jahrgang 1880, Tafel 18. Justus Perthes, Gotha, 1880. (*Dulau.*)

Turner, W. J.—Map of the British Colonies and adjacent Territories in South Africa. Constructed for S. W. Silver & Co.'s Handbook by W. J. Turner, 1880. Scale 1:7,000,000 or 93·6 geographical miles to an inch. Published by S. W. Silver & Co., London. Price 1s.

AMERICA.

Dufour, F.—Mapa de la republica Argentina, del Uruguay. Paris, chromolith. Dufrénoy, 1880. (*Dulau.*)

Johnston, J., C.D.—General Map of part of the North-West Territory, including the Province of Manitoba, and part of the district of Kewaydin, showing progress made in Dominion Land Surveys to March 1st, 1880. Compiled and drawn by J. Johnston, C.D. Scale 1:2,500,000 or 34·4 geographical miles to an inch. E. Stanford, London.

—— Map showing Dominion Lands Surveyed and Lands Entered to March 1st, 1880. Published by order of Right Hon. the Minister of the Interior. Scale 1:390,000 or 5·2 geographical miles to an inch. E. Stanford, London.

Martin, A.—Mapa de America central.—Costa Rica.—Guatemala.—Honduras.—Nicaragua.—San Salvador. Paris, chromolith. Dufrénoy, 1880. (*Dulau.*)

Nell-Louis, C.E.—Nell's new Topographical and Township Map of the State of Colorado, compiled from U.S. Government Surveys and other authentic sources. Scale 1:675,000 or 9·2 geographical miles to an inch. Demarest, Fulton Street, New York. Price 6s. (*Dulau.*)

This map contains a large amount of information of great practical value to miners, settlers, and the general travelling public; it is a reduction from the complete surveys of Professor F. V. Hayden, Lieut. G. M. Wheeler, and Mr. Clarence King, and as the topographical and geographical surveys of Colorado are probably more perfect than those of any other State in the Union, the author has had abundance of reliable material from which to compile the present map. A special sign distinguishes every inhabited place, so that county seats, post offices, or minor settlements can be distinguished from each other without difficulty. The county boundaries and townships (surveyed to July 1880) are given, while the military reservations, private land grants, and all the arable land, have each their distinguishing colour; all the routes of transportation, existing or proposed, with their profiles, passes, and practicable mountain trails, are also given. The number of local altitudes shown on the map are so numerous that the approximate height of every spot can be found by interpolation between the nearest enclosing contour lines which represent vertical intervals of 1000 feet. Separate tables are printed on the map, giving the area of counties and of arable land, and the positions of astronomical stations, being the base for the triangulation and topographical surveys. The map is clear in its execution, and folds into a sufficiently small space to be carried in the pocket.

Ravenstein, E. G.—Eisenbahn-Karte der Vereinigten-Staaten von Nord-Amerika und von Britisch. Canada bearbeitet von E. G. Ravenstein. III^te^ Auflage. Scale 1:5,000,000, or 66·6 geographical miles to an inch. Jaeger, Frankfurt a/M., 1880.

In addition to the existing railroads of the United States and Canada, the waggon roads, and lines of inland steam navigation are shown; there are also five inset maps (on an enlarged scale) giving the means of communication in a portion of the eastern States, Central Pennsylvania, and the vicinity of the Cities of New York, Boston, and Chicago. As there is no hill shading, and as the lines are clearly laid down, it appears to be a map that would be very useful to travellers in giving them a good general idea as to the best routes by which to travel between any two given places; for detail it would of course be necessary to refer to a map on a larger scale.

AUSTRALIA AND NEW ZEALAND.

Committee of General Literature, &c. — Map of New Zealand, published under the direction of the Committee of General Literature, &c. Scale 1:1,300,000 or 17·7 geographical miles to an inch. E. Stanford, London, 1880. 4 sheets.

Hughes, W., & Turner, W. J. — Map of Australia and New Zealand, with the Fiji Islands, constructed by W. Hughes for S. W. Silver & Co.'s Handbook; with additions and corrections to 1880 by W. J. Turner. Scale 1:20,000,000 or 273·9 geographical miles to an inch. Published by S. W. Silver & Co., London. Price 1*s*.

CHARTS.

Imbert, A. — Carta generale del Mare Adriatico in quatro fogli, compilato sui lavori della Regia marina italiana e dell' I. R. marina austro-ungarica, sotto la direzione rispettiva dei capitani di vascello A. Imbert e cav. F. Oesterreicher 1867–1873. Genova. Price of each sheet 5*s*. (*Dulau.*)

Indian Marine Survey.—Charts No. 851. Sketch of Quilon Roads. Price 1*s*.—No. 1231. Kundari Island to Chaul. Price 2*s*.—No. 1232. Chaul, and entrance to Kundalika River. Price 2*s*.—No. 1233. Jaygad (Jyghur), and entrance to Shástri River. Price 2*s*.—No. 1234. Dabhol and entrance to Wáshishti River. Price 2*s*.—No. 1235. Ceylon North-East Coast. Mullaittiver (Moeletivoe of the charts). Price 1*s*. No. 171, Port Mouat. Price 2*s*.—Published at the Marine Survey Department, under the superintendence of Commander A. D. Taylor, Superintendent of Marine Surveys, Calcutta, 1880.

Royal German Admiralty.—Seekarten der Kaiserl. deutschen Admiralität, hrsg. vom hydrograph. Amt. No. 31. Ostsee. Fehmarn-Sund. Specialkarte der Sect. II. Scale 1:40,000 or 1·8 inch to a geographical mile. Vermessen in 1872. Berichtigt März 1880. Price 1*s*.—No. 61. Nord-See. Schleswig-Holstein, Westküste. Südl. Theil. Sect. II. Scale 1:100,000 or 1·3 geographical mile to an inch. Nach den neuen Vermessungen S. M. Kanonenboot "Drache." Unter Leitung von Kapt.-Lieut. Holzhauer, 1877. Price 2*s*. 6*d*. (*Dulau.*)

United States Hydrographic Office.—Chart No.
Coast, Chile, Coronel, Lota, and Colcura anchora
Price 10*d.* No. 868. Sea of Japan, Oki Island, Saig
Published at the Hydrographic Office, Washington, Ca
Hydrographer to the Bureau of Navigation.

ATLASES.

Alphant.—Album des anciens plans de Paris publié pa
de Paris sous la direction de M. Alphant, avec le co
Hochereau, L. M. Tisserand, J. Cousin, Fauve, A. De
en fac-similé des originaux les plus rares et les plus i
la topographie parisienne, avec une table analytique
tive de chaque plan. Price 8*l.* (*Dulau.*)

This is a thick folio, and contains 33 plans, c
half sheets.

Andree, Dr. Richard.—Allgemeiner Handatlas in
erläuterndem Text. Velhagen & Klasing. Bielefe
2, 3, & 4. Price 2*s.* each. (*Dulau.*)

These three parts contain the following map
executed; also letterpress explanatory of the map
Koralleninseln in Mercator's Projektion. Nebe
Vesuv. Pico de Teyde. Mangarewa- oder Gambi
Santorin. Wachsen der Korallenriffe. Nordfr
Weltverkehr und der Meeresströmungen in Mer
karte: Schematisches Profil einiger Hauptberggi
breitung der Thiere. Vegetationsgebiete der Erde
burg.—58 & 59. Spanien und Portugal.—60. Mit
Nebenkarte: Strasse von Gibraltar.—73. Völker
Asien.—76. Vorderasien und Persien. Part 3:
Südlicher Sternhimmel.—2 & 3. Westliche und
karten: Wasserhalbkugel und Landhalbkugel. Die
Projektion.—4. Das Sonnensystem. Mondkarte
Niederlande.—66 & 67. Grossbritannien u. Irland.
inseln. Die Shetlandinseln.—68. Dänemark. Neb
die Far-Öer.—69. Schweden und Norwegen.—70 u
—72. Völkerkarte von Russland. Nebenkarten:
burg und Umgebung. Part 4: 13. Völkerkar
Europa politisch.—16. Atlantischer Ocean.—25.
—26 u. 27. Württemberg und Bayern.—28. G
Elsass-Lothringen und Bayerische Pfalz.—30 u.
Hessen-Nassau, &c.—32. Provinz Sachsen, Meckle

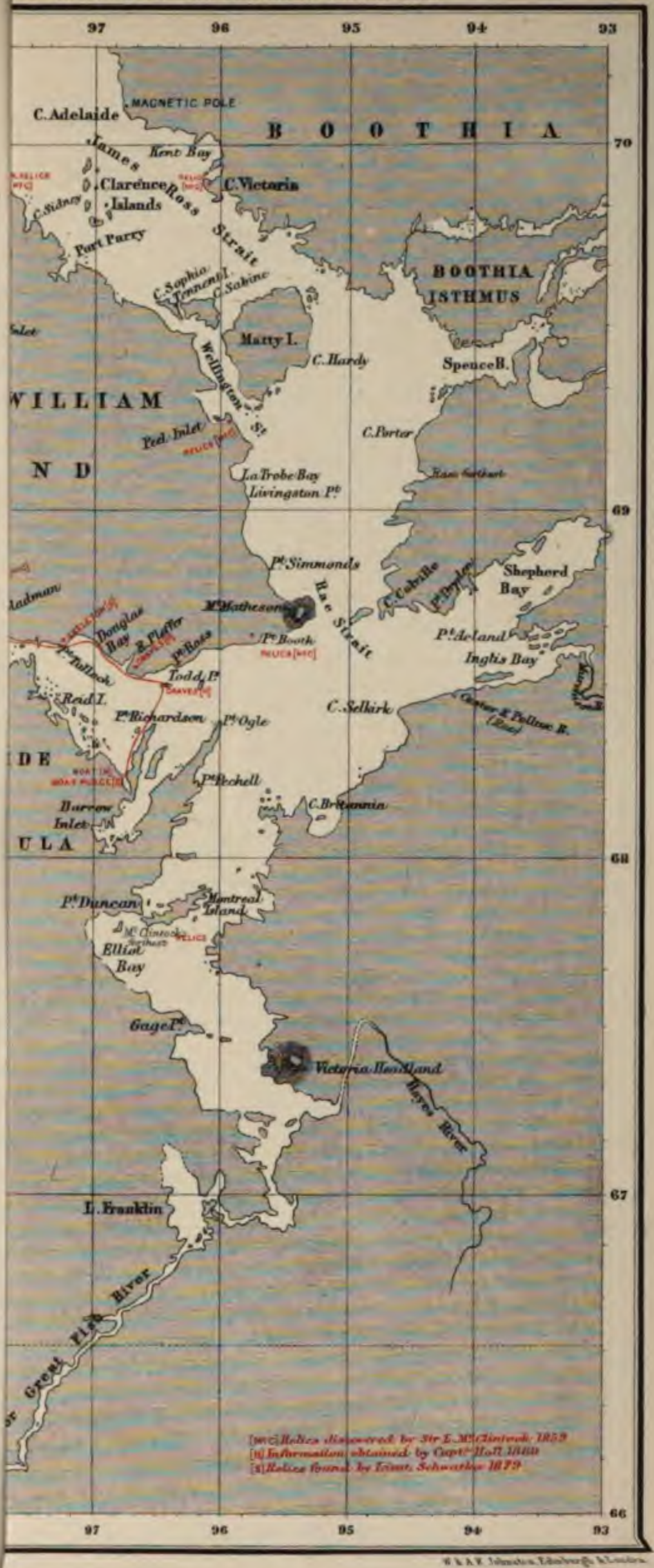
Garnier.—Atlas geográfico de la republica Argentina c
y los de cada provincia. Chromolith. Paris, Garnier

EDUCATIONAL.

Rothaug, J. G.—Atlas zum Unterrichte in den österr
6–8 klassigen Bürgerschulen, mit Zugrundelegung der
methodisch bearbeitet und erweitert von J. G.
Geographie.—2. Planigloben.—3. Europa (Gebirgs- u
(politische Karte).—5. Asien.—6. Afrika.—7. Nord-
—9. Australien.—10. Südwest-Europa.—11. Grossbr
land, Scandinavien.—13. Mittel-Europa (Gebirgs- un
land.—15. Oesterreich-Ungarn (Gebirgs- und Flusska
(politische Karte).—17. Nieder- und Oberösterreich,
Kärnten, Krain, Küstenland.—19. Tirol und Vora
Böhmen.—22. Mähren, Schlesien.—23, 24. Galizien,
der Ungarischen Krone. Artaria & Co., Vienna, 188
(*Dulau.*)

G WILLIAM LAND

OF RETREAT OF THE FRANKLIN EXPEDITION



W. & A. K. Johnston, Edinburgh & London.

ceedings of the Royal Geographical Society 1880.

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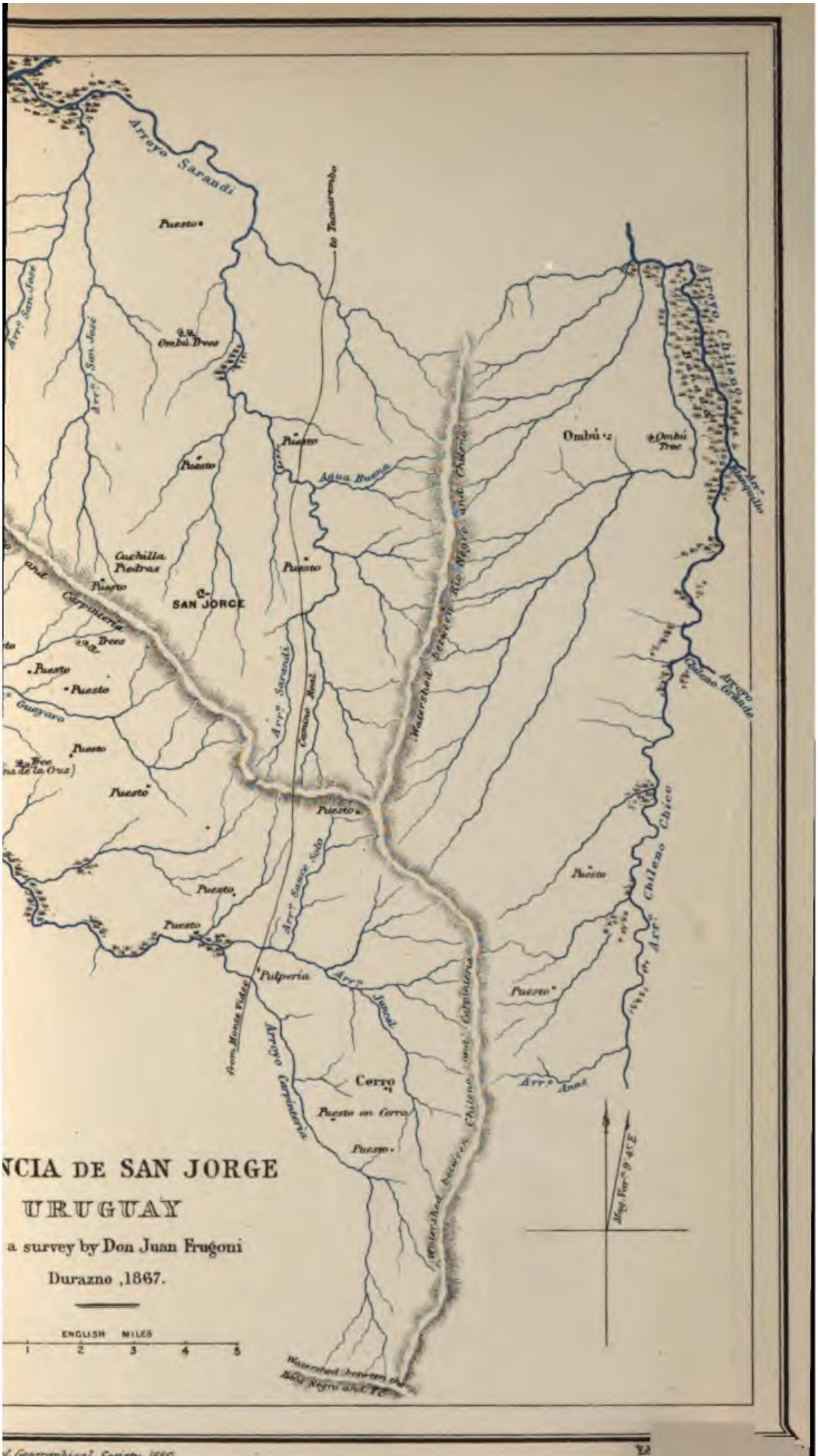

NCIA DE SAN JORGE

URUGUAY

a survey by Don Juan Frugoni

Durazno, 1867.

l Geographical Society, 1880.

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PROCEEDINGS

OF THE

ROYAL GEOGRAPHICAL SOCIETY

AND MONTHLY RECORD OF GEOGRAPHY.

Journey of the Society's East African Expedition.

By Joseph Thomson.

(Read at the Evening Meeting, November 8th, 1880.)

Map, p. 784.

The East Central African Expedition sent out by this Society in 1878, has finished its work; and it now falls to me as representing that Expedition to give you some account of our explorations.

The task set before me is a difficult one. I have to carry you over a vast tract of country hitherto unexplored; to tell you how we accomplished our task fighting with disease and dangers which met us in a thousand shapes; to draw a panoramic view of the chief characteristics of the country and people, and tell you of the general results to science and commerce.

It must be evident that to do this in any detail would require more time than your patience would allow me, and that in the meantime all that can be done is to lay before you such illustrative glimpses as may suffice to give you some general idea of our route and how we travelled over it.

Under these circumstances I will not trouble you as to the reasons for the formation of the expedition, or why it was sent towards Lakes Nyassa and Tanganyika; for such information I would refer you to the Journal and Proceedings of the Society.

Mr. Keith Johnston was selected as leader of the expedition, and I had the honour of being attached to him as geologist and general assistant.

On the 14th of November, 1878, we left London, and after a delightful passage of four weeks reached Aden. Being detained there a fortnight, I took the opportunity of visiting the great fair of Berberah,

and for the first time came in contact with the natives of Africa as
find them in their true barbarian wildness.

On the 5th of January, 1879, we entered the harbour of Zanzib
and were received with the utmost hospitality and kindness by Dr. a
Mrs. Kirk, who, during our stay there, did everything in their pow
to advance the objects of our expedition and make us comfortable.
this they succeeded admirably, as we soon felt quite at home. Wi
such an adviser at our hand as our accomplished Consul-General
himself a well-known traveller—we were never at a loss as to what
to be done in organising the caravan and generally preparing oursel
for the work before us.

After having spent some time familiarising ourselves with the pl
and people, and studying the Swahili language, we resolved to get i
harness by taking a short preliminary excursion to the mountains
Usambara, a district on the mainland north of Zanzibar, in order to g
a fair idea of the work before us and dispel any illusions we mig
entertain.

As the journey has already been admirably described by an ab
hand than mine, I will not trouble you with any description of
further than remarking that we never afterwards saw anything
equal the glorious vegetation that there clothed the mountains a
filled the narrow valleys. From the tiny asplenium to the noble tr
fern, from the flowering scented shrub to the forest giant, nature
her utmost to bring forth the beautiful and the grand in glorious p
fusion, more than realising our ideal of what a primeval tropical for
is, as drawn from descriptions of South American vegetation. T
excursion was one of intense enjoyment, and our satisfaction was by
means diminished by attacks of fever on our return to Zanzibar, as
then looked upon ourselves as seasoned travellers, and like Wilk
Micawber, "ready for anything which might turn up."

A few more weeks were spent organising our caravan, which co
not fail to be a good one with such assistants as Chuma, the w
known faithful follower of Livingstone in his last days, and Camer
servant Juma, together with the immense influence of Dr. Ki
great name to back us up and give it a stamp and a spirit otherw
unattainable.

While awaiting the stoppage of the rain, Mr. Johnston, who
determined not to leave one stone unturned that might lead to
success of our start, crossed over a second time to the mainland to m
sure of the best route, and after his return we prepared to leave fin
on our long journey. The Sultan, who had received us very kin
lent us one of his steamers to convey our goods and men to Dar
Salaam, a town opposite the island of Zanzibar, where we arrived
the 15th of May, accompanied by Dr. Kirk to facilitate our start.
three days all our preparations were complete, and on the 19th of M

to the number of 150 men all told, we started, full of hope and in the best of health and spirits, with everything looking favourably upon us. Dr. Kirk expressed the opinion, "A better organised caravan never left the sea-coast for the interior" (a statement I had afterwards abundant opportunity of verifying), but for this the sole praise is due to the admirable care and forethought of Mr. Johnston, who studied with the utmost diligence the minutest details. Nothing was left to chance, and nothing forgotten. As complete in every respect as any vessel ever fitted out for sea, we started on our march, unfortunately to be only too short a one for our master and leader.

Our route for the first few days led us S.S.W. through Uzaramo along the slightly broken raised beaches which form such a characteristic feature of the east coast of Africa, now crossing a tract of shrub or winding along the hollows and river bottoms amongst coco-nuts, mangos, jack-fruits or bananas, plunging for hours through swamps or splashing wearily along footpaths cut into deep ruts by the heavy rains which unexpectedly continued to fall for three weeks after our start and retarded our movements considerably.

After nine marches we left Uzaramo, and striking more towards the west reached the Rufiji, which proved to our disappointment to be about as much a river of sand as of water.

In the meantime Mr. Johnston had contracted the disease which afterwards proved fatal to him, but which, I think, might have been cured if rest had been taken in time. However, as he was only too anxious to proceed, there could be no rest for him. His mind was set upon reaching Behobeho, where he would halt and, as he hoped, get better; and thus for a fortnight we carried him through swamps, and along great stretches of scrubby desert, in horrible pain from the disease, the jolting of the porters, and the intense heat of the tropical sun.

At last, after crossing a great uninhabited desert covered with acacia thorns, and where rarely a sign of life appears, we reached Behobeho, situated near the lower flanks of the mountain which bounds the great interior plateau.

If cure had then been possible by any natural means, it might indeed have been accomplished here by the pleasant and unwonted sight of hill and dale, of clear sparkling stream, of creeper-clad forest, or open glade studded with the stately fan palm or graceful Taxus, but it had then become too late. From the day we reached the village, he gradually became worse and worse, and only too clearly was death stamped on his face.

On the 22nd of June, letters arrived from the coast which proved to be the last communication ever Mr. Johnston would have with his friends. The effort to read the many hopes of good health and success which they doubtless contained, proved to be too much for his expiring

energies, and on the following day, one of the
who had ever set foot on African shores, was
list of geographical martyrs who have attemp
barriers of disease and barbarism, which mak
almost impenetrable.

It needs no words of mine to speak in prais
of his unequalled qualification for the work lai
as well known to you all as to myself; but
knowledge of him, that his whole soul was i
slightest opportunity of adding to our knowled
and night and day he was ever on the alert
disease, and never satisfied except he saw every
of enthusiasm and in every respect a scientifi
would have led the expedition in a clear, well-d
him we moved as people groping in the dark,
how poor was our best!

It would be impossible to give you even a f
on this unhappy occasion. For the first time i
of Africa I looked upon death and felt myself a
term. At the age of twenty-two I found mys
in which few have succeeded, a work of wh
ignorant.

The question was then whether I should
But though the question arose, it was never e
on the threshold of the unknown, I felt I m
might be my destiny. Though the mantle of
could not descend upon me, yet he left his en
research, and I resolved to carry out his des
power. So I laid him in the forest of Behobeh
green, as his memory will ever be; and on the
fever, I staggered once more forth on my now
the interior and the unknown.

For the next few days our route led us a
or Mgunda, as it is now called, the chief town
by a native of Unyamwezi.

We passed through the narrow valley of th
niferous hills on our left, and on our right t
which form the edge of the great central plate
the fleeting cloud, produce perennial showers,
truly tropical character, to grow and rot in ma

Under such conditions a vigorous or ene
expected; and accordingly we find in the W
miserable and apathetic races to be found in A
me more than to see them gather round me in
miserable withered bodies doubled up, and

looking like so many slave-gangs resting on their way to the coast with all hope of life and liberty flogged out of them.

In passing through Ukhutu, our expedition had nearly come to a disastrous conclusion by suddenly coming upon a war party of a dreaded tribe called the Mahenge. The air for several days had been full of rumours regarding these people, until every one of my men kept himself in readiness to throw down his load and run for dear life on the first sight of the warriors. The meeting did come at last. Early one morning, while winding along through forest and jungle, the foremost men were seen to throw down their loads and rush hastily back, whispering with bated breath, "the Mahenge! Mahenge!" Every load dropped from paralysed shoulders, and a stampede seemed imminent. I was prepared, however, for this emergency, so, seizing my gun, I threatened to shoot the first man who ran away. This new and more immediate danger quite stupefied them, and before they could recover the use of their limbs we contrived, with the aid of the headmen, to get them together round the loads, and somewhat calmed. It then appeared we had not been observed—a most fortunate thing for us, as the Mahenge would then have probably taken us for enemies, and swooped down and completed our flight. I then took Chuma into council, and we came to the conclusion that it would never do to run another such encounter, and that we must come to some understanding with the Mahenge. So we went forward by ourselves unarmed, and soon came face to face with these savages, who were dressed and armed in complete Zulu fashion, in fact almost exactly like the "friendly Zulus" now on exhibition in London. We at once became the best of friends, on stating our objects and where we were going, and thus that great danger was avoided.

At this time I was much reduced by fever; but, like another African traveller, having few medicines and not knowing how to use them, I recovered by braving it out and marching as long as my legs would uphold me—an excellent cure, though difficult to apply.

After reaching Mgunda, we turned away south through a rich valley depopulated by the Mahenge, and crossing the Ruaha, entered the country of the latter. With regard to this interesting and hitherto unheard of tribe, I need only say that they occupy the angle formed by the confluence of the Ruaha and Uranga rivers, having as its base the plateau to the west.

The country is quite level and exceedingly rich, while the people, having been brought many years ago in contact with a migration of Zulus, had adopted their arms, dress, and manners, becoming in all outward appearance perfect Zulus, though they had no more affinity to that tribe than a donkey in a lion's skin has to a lion. They were a set of most arrant cowards, a mean, sneaking, lying race, unworthy of the name of men. While at the chief's town, Mkomokero, we were compelled to stay four days on exhibition, and during that period we were very popular and quite the rage, people frequently coming long distances to see us, much to our apparent satisfaction, though extreme annoyance.

While here I took the opportunity of visiting the Uranga, which I found to be a fine river of considerable depth. I had contemplated following it up, but from the information I collected I found that to be impossible.

Being compelled to give up this intention, we once more resumed our march, taking a westerly direction, reaching the base of the plateau, where we felt at last we were about to enter the interior.

We had now crossed the first part of our route, the most trying of all in every respect, where the European is first brought face to face with the hardships of travel, where he must ever be ready to do battle manfully with disease and danger, and be ever on the alert against desertion and stealing. Few caravans cross it without manifold troubles, and we too had had our share. Our leader had been carried off by death, and I had not myself escaped the deadly effects of the climate. Troubles and hardships had beset our path, but of one thing we could boast—we had not lost a single man by desertion or death, not a yard of cloth had been lost or stolen.

No caravan, whether Arab or European, had ever performed the same feat, for in this our experience was unique. Our progress had been slow, but it had been sure. We made no brilliant march, but moved soberly onward, and leaving nothing behind but goodwill and friendship, teaching the native that our mission was peace, and that the word of the white man could be trusted.

The mountain ranges which bound the great central plateau consist of metamorphic schists and gneiss lying along a line of weakness, owing to which they have been folded up, and thus escaped the great pressure produced by the contraction of the crust of the earth due to the secular loss of heat, and which has turned the main mass of the plateau into granites. We took ten days to cross these ranges, and were nearly starved in consequence of having been directed wrongly. It was with the utmost difficulty we scraped together sufficient food to give each man half rations, and during two days hunger stared us in the face.

Our progress also was very slow owing to the steepness and slipperiness of the paths up the mountain sides. To add to our difficulties, I was here seized with a horrid attack of rheumatic fever, which lasted more or less all the way to Tanganyika. The principal symptoms were palpitation of the heart and shortness of breath combined with extreme weakness. Every few steps made me stop, gasping for breath, with my heart going at railway speed, and frequently I was compelled to lie down an hour to recover sufficient strength to allow me to proceed.

Still with all this our march had its pleasures,—the sound of the many splashing streams with their fern and tree covered banks, the strong odour of honey-laden flowers, forest clumps with hoary lichen-covered trees through which the wind sighed, and over which the driving mist flung a ghastly mantle. Now and then a group of savage natives crowned some lofty eminence and watched our progress through the half-veiling cloud as we wound our way along rocky dells or deep down in gloomy valley appearing and disappearing amongst the trees. These were charms which no amount of fever could blind us to, which acted as a solatium to all our troubles and fascinated us with a boundless sense of liberty.

At last we fairly entered the interior, and nothing can express the disappointment that took possession of us at the scene which opened up before us. A great stretch of bleak moorland country, varying from 4000 to 5000 feet in height, extending away to the far horizon on every side, unrelieved by hill or dale or forest tree. A grassy undulating country rising into rounded ridge to fall away into a rounded valley, monotonous in form and colour but for the occasional occurrence of a patch of shrub, a grotesque baobab, or equally singular euphorbia. Not a sign of life, with the exception of the parson crow, a tawny vulture, or it might be a herd of cattle; while a sharp cold wind blew from morn till night unopposed by sheltering hill or forest, causing the men to shiver and shake under its influence, and stop to light fires to warm themselves at midday. The scanty population is located in villages at very wide intervals, and the cold clayey soil, cultivated only in garden-like plots, yields but little sustenance for men who have to depend mainly on their cattle for food. Such is Uhehe. The people are a fine-looking race of gentlemen savages, who dress indifferently in nothing, or roll themselves into a winding-sheet of 12 yards of cotton.

They treated us most courteously, and always took indirect means of telling us anything unpleasant, such as the amount of honga that was expected; and when I offended the chief by neglecting a piece of etiquette, I was only punished by being deprived of a sight and audience of him for six days, which I employed in writing and despatching letters to the coast.

Our march at this period was not without its troubles. Thoroughly reduced by fever, I have marched frequently till I have fallen on the road. For one month my memory almost entirely forsook me, and but for my constant practice of noting every observation down at the moment, I am afraid my diary would have shown a considerable blank at this period.

Under such circumstances it was not easy to instil much spirit into my men, who, under the combined influence of deficient food and that of an indigestible character, cold bleak winds which kept half of them ill with rheumatic pains and cramps, were becoming very mutinous, a disposition which at last found vent in a grievance they grumbled under. It had been my custom to fine instead of flog them for misdemeanour, a plan they did not like, and at last on my application of it in a particular case, they all declared they would desert me if I did not remit it. I was, however, firm. That same night every man brought his gun and laid it down before me, and on the following morning, very much to my amazement, the whole caravan, with the exception of six, marched out of the camp to death or slavery if they persisted in their attempt, which I cannot believe for a moment they would have done; but whatever may have been their real intention, I could not afford to run the risk of their carrying it out, ruining the expedition almost within sight of Lake Nyassa. So I gave way, and on my promising to flog them to their hearts' content and not fine them, we once more became the best of friends, and each man returned to camp, shouldered his load, and marched along as if nothing had happened, and thus a second time did the expedition run a hair's-breadth escape of ruin.

Resuming our march through Ubena after our detention at the chief's town Mkubwasanya, we reached, on the 10th of September, the base of a second and higher plateau, which rises from 6000 to 9000 feet, but is so cut up by denudation as to appear like a series of mountains. This high tract of land extends round the north and east sides of Lake Nyassa half-way to Tanganyika and round Lake Hikwa, or "Leopold," as I have presumed to call it.

It consists to the north and west of metamorphic clay slates, with here and there felspathic rocks intruding, while immediately round Nyassa the rocks are purely volcanic porphyrites and tuffs.

The difference in the internal structure of this plateau has determined to a very marked extent the surface outlines produced by denudation. Thus the mountains of clay-slate are distinguished by rounded grassy forms, generally smooth and uncut, uniform in shape and colour, and by no means picturesque. Pass from these to the volcanic rocks, and we observe at once a marked change. We have sharp jagged peaks, precipitous rocky sides, notched and cut in the most irregular and striking fashion, as becomes mountains formed of such diverse materials as compact lava beds and loose tuffs and agglomerates. Add to these features huge yawning gorges and great precipices where vegetation in vain attempts to grow, and some notion of this plateau may be formed.

But it is not only in its physical geography and geology that this mountainous tract is interesting. Equally with the students of these sciences, would the ethnologist find his enthusiasm warmed by a study of some of the most miserable and degraded types of the negro race I have met in my travels. These form three small tribes, called the Wapangwa, Wanena, and the Wakinga. They have dark sooty skins, prognathous jaws and thick lips, with small heads and shrunk-up withered bodies which speak of an existence of the most miserable character. They go, as a rule, perfectly naked, and live in conical huts seven feet high and five or six feet in diameter, into which whole families huddle themselves like so many pigs, crawling in and out through a hole, the only apology for a doorway they have got. The contents of these huts consist of only one or two pots. The mental endowments of this people correspond with their physical appearance. We found it almost impossible to communicate with them, as they seemed to be entirely devoid of any abstract ideas, and appeared to be completely shut off from all knowledge and communication with the outside world. Most travellers contrive to find some peculiar tribe unlike all others in some curious particular; and not to be out of the fashion, I might speak of a part of these natives, more especially the Wapangwa, as the squinting tribe—the greater number of them in many villages not having the power of looking you straight in the face, but dealing in asides—a peculiarity I afterwards found common among the Warua near the Congo.

After a few days' march over this interesting plateau, we were inspired with new life by the sight of the great Nyassa Lake away in the far distance and 4000 feet beneath us, and after a three days' march of extraordinary difficulty and hardship we reached its shores, every man of us completely worn out.

We here felt as if we had arrived at a promised land. Camped in a niche of magnificent and almost perpendicular mountains, under the shade of great sycamores, and with the constant roar of Nyassa breaking at our feet, with its heaving bosom and its cool breezes, we felt we were well rewarded for all our trouble.

After a stay of five days at Pupanganda, during which a number of the porters who had broken down among the hills arrived, we commenced the second section of our work.

Everything, however, now looked favourably upon us. I had learned by this time to have more confidence in my men, and not to look upon them as ever ready to desert or plunder me. Through hunger and disease they had remained faithful, and every man who had left the coast with me stood by the shores of Lake Nyassa and answered as cheerfully to the roll-call as he did by the Indian Ocean. The natives of the country also appeared under a new light. We found that everywhere a persuasive word was more potent than gunpowder. They might be treacherous, bloodthirsty, and given to plunder and falsehood, but we had now traversed some 500 miles of the African interior and had experienced none of these things.

On leaving our camp at Pupanganda, we rounded the north-west corner of the lake, crossing by canoes a large stream called the Lufira; then, a short distance further on, the River Jumbaka; finally camping at Mbungu, the chief town of Makula, and the starting-point for Tanganyika.

Makula's country forms a triangular space cut out of the plateau, with the apex towards the west, and having the waters of Nyassa as its base. Flat towards the east, it gradually rises in altitude to the west, becoming more and more rugged, till at the apex it reaches the general level of the tableland.

If time permitted me, I would like to describe to you Makula, his people and his country. Nothing more interesting have I met than the charming arcadian simplicity of life and manners that there existed. The clean and ornamental villages would have adorned the neighbourhood of any nobleman's park, and the richness of the soil was quite unrivalled. Owing to previous reports, I entered the country with apprehension, and I left it, as I left no other place, with regret.

To the geologist also this district has special interest, in the most beautifully preserved examples of extinct volcanic cones that can well be conceived.

Three large streams drain Makula's country and the subtended plateau. The largest is the Lukuviro, which runs along the base of the Uchungu Mountains and drains most of the area. Passing through the middle of the country is the Jumbaka, and near it the Lufira falls into the lake.

Leaving Makula's country with its huge banana groves, and passing through a small tribe called the Wakukwe occupying the apex of the triangle, we regained the top of the plateau, rising suddenly from 4000 to 7000 feet, and then to 8000. This brought us into the country of Nyika, an almost treeless, grassy upland, very much broken and hilly. The Wanyika were by no means comely, though their faces were not of a low type. They were remarkably bold and rude and exceedingly inhospitable, probably owing to their constant state of warfare with Merere and his people, whom they have no chance of resisting, from their want of any superior chief and common action among them.

They live in small, dirty villages of beehive-shaped huts, huddled together, and placed in strong positions to resist attack.

There was little to mark our progress along this part of our route, save the irritating conduct of the men, who were always unscrupulous in their means to gain a day's rest. One of their favourite dodges was to manufacture as many invalids and sick men as possible, and then declare that there were so many ill that it was quite impossible to proceed without a day's halt. I at last determined to stop this nuisance, and an opportunity soon came.

One morning, on marching out of camp, I observed an unusual number of woebegone faces. I saw at once what was coming, but took no notice, and marched on in front. I was not surprised to find myself three hours in camp before my men, or to observe a miserable string of them marching like a band of pilgrims with peas in their boots. In the evening I called all the sick men up, most of whom I knew to be shams, and inquired what were their ailments. They all had the same story. That vulnerable point in the African constitution—the stomach—was deranged, at which I rejoiced, having a very simple remedy. Going into my tent, I brought out all the castor-oil I had. It would have been a most edifying spectacle to any disbeliever in that simple medicine to have seen the immediate effect that the very sight of it had upon them. Groans were hushed, and long faces relaxed and became cheerful, though a look of alarm spread among the patients—for be it understood that there is nothing a native detests more than European medicines—so that a large number were for retreating at once, cured with one sight. But that was not going to suit my views; so I administered, not without difficulty, a very large dose to each one, letting him understand that if it did not prove efficacious, the dose would be repeated next morning. There was a good deal of stir in the camp that night, and in the morning there was not a man on the sick list; and thus, having no excuse for a halt, each one cheerfully shouldered his load and marched. Nor was the same dodge ever repeated.

The chief characteristic of this part of the country was its utter barrenness and the absence of anything worth trading for, and on the latter point I might be allowed to make a few remarks. From the offhand manner in which a number of travellers have come to conclusions on various questions of trade, people have generally formed the idea of the extreme richness of Central Africa, and look upon it as the El Dorado of the future. One traveller, for instance, hears of much iron being worked on a mountain, and concludes that it is probably a mountain of iron; another observes some nodules in the soil, and concludes that all underneath is iron. He sees a black rock in a precipice, and calls it coal; a white one, and he calls it chalk, until people have come to look on Central Africa as the future hope of the world.

This has not been my experience; and I have now gone over a considerable area. Nowhere have I seen a single metal in a form which a white man would for a moment look at as a profitable or workable speculation. There is, no doubt, a considerable abundance of iron in many parts, but very little more than sufficient to supply the simple wants of the natives. Coal I saw none, and my researches would lead me to believe that such a thing does not exist over the wide area embraced by our route.

Ten marches through Nyika brought us to its western limit, where the altitude is only 3800 feet, and the drainage is towards Lake Leopold. From this point the land rises again to some 6000 feet at the Chingambo Mountains, which form the boundary line between Nyika and Inyamwanga, the next chieftainship to the west. Mlilo, the chief, proved to be a very typical example of an African potentate, keeping up considerable style, living almost entirely on pombe (i. e. native beer), and bursting with the idea of his greatness and importance.

The streams diverted from the north and east by the Chingambo Hills trend south and west to the Chambeze. They are all, however, of an unimportant character. The country in its general aspect of shrub-covered hill and dale varies little from this point to Tanganyika; it rarely descends below 4000 feet and seldom rises above 5000 feet. On leaving Inyamwanga we enter Mambwe, which is partly drained by the tributaries of the Chambeze and partly by streams flowing to Lake Leopold.

After crossing the hilly country of Ulungu, our eyes were once more gladdened on our weary pilgrimage, on the 2nd of November, by the magnificent sight of Lake Tanganyika, whose glancing and rippling waters were spread out beneath us at the bottom of its great crevasse, and in the enthusiasm of the moment we gave way to unrestrained joy. We made the hills resound with the roar of our guns and the woods re-echo with our shouts, as down went the loads, and in lively circle the ground was ploughed up under the energetic dancing of the porters, who seemed to be about as much rejoiced at the sight of the lake as I could possibly be myself.

Our work, as laid out for us by the Society, was now finished, and we might with all honour have retraced our footsteps to the coast. The sight, however, of that grand lake raised at once a great craving to see and know more of it, and there was the fascination of a mystery about its outlet which I longed to solve, and thus the Lukuga was resolved upon as the terminus of our march. At that classic spot Pambete I rested six days, during which, to my unbounded surprise and pleasure, I was joined by Mr. Stewart from the Scotch mission station of Livingstonia, on Lake Nyassa, a meeting which brightened me up considerably. I need hardly remind the Society that it was during his visit that the important observations which fixed the longitude of the southern end of the lake were made.

All accounts agreed that it would be quite impossible for me to take a caravan along the west side of the lake, and that no one ever attempted it, owing to the difficulties of the mountains.

But I had set my mind upon the project and was determined not to be beaten. A suitable place was at last found at Iendwe, near the mouth of the Lofu, to camp my men, under the charge of Chuma, during my proposed visit to the Lukuga. Taking only thirty porters and a supply of absolute necessaries, we started on our march, and with it commenced a piece of work which for difficulty and hardship beat anything we had yet encountered. The rains had set in, as only tropical rains do set in, and day after day we plodded through it, along mountain ridges or deep down in narrow gorges, plunging time after time through swollen mountain torrents, or scrambling up precipices, while the deafening roar of the thunder, which is so frequent in the rainy season, echoed and re-echoed on every side. Now the storm was below, anon around or above us, while at intervals we had a glimpse of Tanganyika thousands of feet beneath. The difficulties of our route were indeed so great, that it required eight men to carry Admiral McDonald's collapsable boat, which had been brought all the way to the south end of the lake by two of our men. We marched along the edge of the lake as far as circumstances would permit, and frequently had splendid views of the opposite side, which, 30 miles off, stood out as sharply and as well-defined as if only a few miles from us, revealing every notch and valley with their varied tints and shades. In the dry season the opposite side cannot be seen at all except on rare occasions.

Time will not permit me to enter into any details regarding either the country or people along this section of our route, though there is much that is highly interesting.

I might tell you, for instance, how I was taken prisoner at the chief town of Itawa and escaped by laughing at the excited warriors of the place, who evidently thought there was something uncanny about me, as I certainly did about the village, for to be a prisoner in a place ornamented with a few hundreds of grinning human skulls was not at all pleasurable.

The natives of Marungu, immediately north of Itawa, surprised us very much by their extreme excitability. Taking us for enemies and slave-hunters, they used to gather round us in great crowds and in the maddest excitement, yelling and shouting like demons, brandishing their weapons as they danced round us, now running away with fierce war cries, and then in their excitement rolling about on the ground as if in convulsions. If they had been on red-hot plates of iron they could not have raised more commotion.

With my little band of followers, it required the utmost coolness and diplomacy to prevent an attack. Had such a thing happened we should certainly have stood a poor chance of surviving it. We, however, always contrived to make friends.

The Marungu natives dress in hides or in coarse bark cloth, and live very miserably. Those dwelling in the mountains are distinguished by immense swellings in the throat, a disease which does not affect the people of the same tribe living near the lake.

While traversing these rugged mountains, I was again very much reduced by fever, in fact so thoroughly broken down, that I could have walked with the most philosophical resignation into the lake. But still we pressed forward till, on Christmas Day, 1879, I got a new lease of life and vigour by the sight of the noble river Lukuga moving swiftly away, bearing the drainage waters of Tanganyika to the far west—to the Congo and the Atlantic. I could hardly believe what I saw, after thinking of Cameron's straws and Stanley's barriers, for there before me swept a current which no canoe could paddle against and which could only with difficulty be crossed.

I thought I was the first to see this great sight, but it afterwards appeared that Mr. Hore, of Ujiji, had the priority of me in settling the problem of the lake's outlet.

A long day's march from the Lukuga br
Mtowa as it is more properly called, where, t
found unexpectedly a station of the London Mis
I was received most hospitably.

The founding of this station is a fine ins
energy of the English, and suggests compar
attempts of the Belgians. The expedition wh
month after me from Zanzibar, and took the ca
On the road they buried their leader, Dr. Mu
a council was held, and all arrangements comple
of the party previously sent by the same Societ
took them across the lake to Mtowa. A hous
and a garden laid out, and there with a heart
were ready to receive me, like old settlers, whe
the honour of being mistaken for Stanley fresh

After seeing the last of their Christmas pud
my letters on New Year's Day, I got a passag
a cargo of marketable humanity to Ujiji, wher
nearly wrecked in a frightful midnight storm,
washed into the arms of that most generous a
missionaries Mr. Hore, the agent of the Londo
Ujiji. A few days under his fostering care co
and I may add that from the date of my arriva
suffered a day's fever.

From the wreck of the Abbé Debaize's gre
small supply of goods to take me back to my
eight days returned once more to Uguha, and no
Lukuga down to its confluence with the Congo.

On this new enterprise we started on the 1
hope and confident of success, though my men
go, having become thoroughly sick of their l
morning they had to be literally hunted out of t
and then every conceivable obstacle at their c
my way to retard my movements and compel me

We found the Lukuga winding away W.N.
most charming valleys I have seen in Africa; b
rising on each side from 600 to 2000 feet above
while forest clumps and open glades diversified
river's banks, where antelopes and buffaloes graz
river itself moved along in an exceedingly rapid c
along which it roared and surged, making any
matter of impossibility.

For six days we pressed on along its untrod
the men broke out in open mutiny, and so una
not one would assist me in disarming two of t

hard struggle I contrived to do myself, the rest standing by in strict neutrality.

Their argument for turning back was that I was taking them to Manyema, where they would all be eaten up, and go they would not.

My good fortune had at last deserted me, and now with a new prize in my hand I was compelled to let it go, and leave to some one else the pleasure of seeing the waters of the Lukuga mingle with the Congo. The place where my first defeat occurred is a village called Makalumbi, the last Uguha settlement to the west.

My hope of following the Lukuga having been thus frustrated, there was nothing left to me but to get back to my camp through Urua and Kabuire, visiting Lake Moero if possible. Crossing the river and ascending the hills on its southern bank, there, spread out before us, lay the great plain through which the Congo—or, as it is here called, the Lualaba—finds its way north from Moero till it turns west to the Atlantic.

There are few inequalities to diversify the landscape, save the noble strips of forest alternating with jungle grass. The country is called Urua, and is ruled over nominally by a chief called Kiyombo, under whom are many minor chiefs.

The Warua are a very fine looking race of men, and are possessed of well-made figures, which the women adorn most artistically with tattooing. They wear a kilt made of the fibres of the Mwale palm, and dress their hair in the most elaborate fashion, the operation requiring two days' hard work. They are exceedingly ingenious in their carvings, and in every respect they are neat in their appearance and cleanly in their habits, but there all praise ends. After the kind and pleasant way I have been received by almost every other native tribe, I would like to be silent regarding the Warua, but truth compels me to say that they are the most arrant scoundrels and thieves I have anywhere met.

For three weeks we were amongst them, and during that time we were not sure of our lives for a single moment. There we were, thirty men with guns but no ammunition, surrounded day after day by excited multitudes, who only required the slightest spark to set them aflame, which meant annihilation to us, and the only thing which prevented such a catastrophe was their ignorance of our lack of ammunition; and having a superstitious horror of an instrument of which they had heard so much, they did not dare proceed to open bloodshed. I fostered this feeling by exhibiting my shooting powers on a tree with my Express rifle, for which I had still some cartridges.

They scrupled not, however, to tear the clothes off the men's backs even in a crowd. Night and day we had no peace, and I had to be constantly on the alert to prevent a quarrel between my men and the Warua. The rapacious chiefs would have whatever they demanded, and they were continually taking every opportunity they could find, to

get us into trouble as a pretext for further exto
of a dog. I was detained a prisoner and fined
name of a chief in my note-book. The same w
watch, until I dared not show a single unusual

Philanthropists, however, will be glad to h
their character. They had an unbounded a
European, and would have whatever they saw,
anticipation of getting to my camp minus my cl
to be taken in the dark, and everything except th
had to be done in secret. It was thus then we
but hope of safety rose within us when we got ne
chief's town Makiyombo. We were soon undeceiv
six days, during which we were several times in
lives, the dictum of the chief went forth. Th
next tribe, we could not be allowed to pass
according to their custom, by the same route w
sounded to us like our death knell. As long
big chief they dared not go to extremes, but no
his share and dismissed us in disgrace, what we
jackals? Back, however, we must go, whatever
porters, reduced to despair and knowing that
sticking to me, behaved admirably, and back w

I need not enter into detail with regard to ou
give you a sample of a night's work. We had a
being rather better received than usual, I resolve
which I had been deprived for some nights, b
midnight I was awakened with a funny sensati
dragged by my blanket out of my tent by no g
the yells and the shouts from all parts of th
imagined I was in the lower regions. In the
comprehend my position, till at last, jumping
smash against an M'rua, knocking him over.
looking about for my gun, I regained my te
almost every portable article, while scampering
the robbers. Sending up a shout for my men
in as bad if not a worse plight than myself,
a good deal of difficulty that we could get then
utterly deprived of their clothes, though some b
of portions of the garments of their enemies.
together ready for fight or flight, and formed
mined-looking band, that the natives hesitated
yelling and dancing round us in hundreds.
began to drop off, which we took advantage
bolted. This will give you some notion of ou
Warua.

At last we sighted the Lukuga once more, and when we had got its waters between us and the Warua, we felt as if we had escaped from a valley of death. A few more marches brought us to the shores of the lake, and I re-entered Mtowa, riding on that meek animal, the mission donkey, as became a defeated traveller. We presented a very woe-begone appearance, stripped of almost everything when we once more greeted the missionaries, but our spirits were soon raised again on hearing that Mr. Hore was expected every day from Ujiji on his way to the south end of the lake. We had not to wait for him long, and on his arrival he at once generously offered to take me down to my camp, thus relieving me from a great difficulty.

The sail down the lake in the mission boat, admirably named the *New Calabash*, was full of romance and adventure, and will ever be a bright spot in my travels.

Bidding farewell a second time to Messrs. Hutley and Griffiths at the mission station, on the 23rd of March we commenced our voyage. Crossing to the east side, we arrived on the following day under the majestic peak of Kungwe as the sun rose behind and gilded its top with gold, producing a marvellously beautiful scene. We then continued our way along the coast, sometimes sailing with a favourable breeze, sometimes paddling, accompanied by the wild song of the Wajiji boatmen, or lazily drifting with the swell. At night we usually ran into one of the many charming little creeks which all along the east side cut into the precipitous sides of the lake, resembling in their appearance the fiords of Scandinavia. Without landing, we made ourselves as comfortable on board our boat as the greatest possible number of acute angles in our sleeping-place would allow, and slept as best we might without shelter of any kind, to be awakened now and then by the roaring of the lion, the weird grunting of the hippopotamus, or the hooting of the owls, while the camp fires of the boatmen, with their ruddy glare intensifying the outer gloom, accorded well with our romantic surroundings. Then as the moon rose over the horizon, every one was aroused; into the boat they came tumbling cold and shivering, and out we stealthily pulled like some old buccaneers on a plundering excursion.

Fairly into clear water, the men would take to their paddles with a will, breaking the deep silence with the splash-splash and accompanying song. Then as morning broke, we would enjoy a wash and a frugal meal of cold boiled beans and sugarless tea, to continue our course under a burning sun. It was a hard life, but a fascinating one.

On our way south, we took the opportunity of visiting the Belgian International Association Station, Karema. We found stationed here Captain Carter, of the Elephant Expedition, who gave us a jolly Irish welcome, and on the following day we met Captains Cambier and Popelin, with whom we dined.

Leaving Karema, we continued our voyage down the lake, seeing

much that was picturesque and beautiful,
appointed with the monotony of the scener
unvarying tint of green, the same unbroken
have been inexpressibly dreary but for the
jutting cape, or a small island.

The chief feature in the scenery was th
blocks which everywhere lined the shore, and
our travellers an opportunity of airing their c
get eloquent upon the subject of great conv
blocks and producing indescribable chaos. To
these things. I saw in them only the slow
rain, wind, and rapid denudation, to produce a
which a strong imagination is apt to assign to

On the 4th of April we reached the isl
south end of the lake, and during the night
where I had left the main-body of my men.
I received such a reception as brought tears
given me up for lost, and on seeing me aga
with joy; and for twenty-four hours they da
man sank down exhausted. I found Chuma h
my absence, so that everything was in the bes
missing.

I had formed the project of returning to th
route to Kilwa, but I was doomed to disappo
menced in the intervening country, and to pa
sible; so, very much to my disgust, I found
route was by way of Unyanyembe, down th
coast.

Our preparations for the return march w
bidding farewell to Mr. Hore, we turned our f

Rounding the southern end of the lake a
Kilambo, we struck inland, and soon regained
an average height of from 4000 to 5000 feet,
lamfipa Mountains on our right, rising majest
and 9000 feet. We found we had no reason to
gramme, for the country we now entered wa
character from anything we had yet traverse
open valleys flanked by real mountain ranges n
The soil is rich and well cultivated, and t
entirely given to agriculture and not joining i
Our route led us through the centre of Fipa, t
we visited at his capital, Makapufi. He prove
the style of the kings of Karagweh and Ugand
and living solely upon native beer. He is p
wearing anything but a simple loin-cloth.

We had here the pleasure of being the first to see that curious lake, named variously Rukwa, Likwa, and Hikwa, which has assumed so many shapes in the fancy of different travellers and geographers, and which we have now taken the liberty to call Lake Leopold. We saw it from an altitude of about 8000 feet above the sea, its surface lying more than half that height beneath us, and the mountains rose in such perfect precipices all round that it seemed as if we could throw a stone into it. One of its peculiarities is that it has no visible outlet—a fact which admits of little doubt. From my own personal knowledge I can say that none exists either north, south, or west, while Elton and Cotterill in passing near its eastern side found no stream flowing from that direction.

Leaving the highlands of Fipa we descended to a magnificent plain, through which a large stream called the Mkafu finds its way to Lake Leopold.

Crossing this, we reached the town of the redoubtable chief Simba, by whom we were received with great honour. This chief has long been a thorn in the side of the Belgian and French Expeditions, and is now credited with the murder of Carter and Cadenhead. He, however, received me in the most hospitable manner, though I was in his power completely for two days. Three marches from Simba's I met Cadenhead on his way to join Carter, and on the following day I met Messrs. Roger and Burdo, two Belgian gentlemen, trying in vain to reach Karema. They had then lost two gangs of porters, and under their complicated troubles they seemed much at a loss what to do. They were on the search for new porters when I met them, in the forest half-way between Karema and Unyanyembe.

After reaching Simba's, we had fairly got back to the old beaten track which had now so often resounded under the iron heel of the explorer, in spite of all my efforts to keep off it; and practically my work was done. I need not, therefore, describe to you our triumphal march into Unyanyembe, the best-dressed caravan that had entered it for years; neither need I speak of the princely hospitality of the Arabs.

After a few days' rest at Unyanyembe, we recommenced our march, and joyously pushed on for the coast. Going from 20 to 30 miles a day, we soon crossed the Mgunda Mkhali—the "Fiery Field"—passed unmolested through Ugogo, heeded not the burning heats and hard marches of the Marenga Mkhali, nor the rough and stony paths through the Usagara Mountains, till at last, after a march of unprecedented speed, we sighted the Indian Ocean, and reaching Bagamoyo, entered it with all the pomp of bloodless victory—not careworn and haggard, decimated by disease and hunger, but in the best of health and condition; and there stood my gallant band of followers, proud of their achievements, and thanking God they were not like others, who steal and plunder from their masters and desert them at the hour of need. I felt

it to be my proudest boast that of that band
Dar-es-Salaam, only one did not survive to see
and it will ever be a pleasure to me to think,
in critical positions, I never once required t
offensive or defensive purposes.

On the conclusion of the above, the President in
James Stewart, C.E., the explorer who had followed
footsteps, in his march from Lake Nyassa to the southe
Mr. Stewart having recently returned to England, h
attending the present meeting. He would no doubt b
information regarding the country between the two lak

Mr. **James Stewart** said he had listened to Mr
present had, with great interest, and thought he de
energy and tact he had displayed throughout his long
regard to the satisfactory relations which he had succe
caravan, he would call attention to the fact that trav
place great confidence in their native followers. E
learned thoroughly to like the African, and this fee
natives, as is natural in such cases. He had been muc
account of the Lukuga outlet of Lake Tanganyika.
imagine such a lake without an outlet. They were, h
that the waters of Lake Tanganyika, for a very consid
been without an outlet, for, from the age of some of th
shores, which had been killed by the rising waters, h
lake could not have been so high at any time with
the Lukuga outlet been in abeyance the whole of
been that the last bank formed across it was hig
possible at present to say. The Livingstonia Mission,
possessed the best, perhaps the only available rout
Africa. The whole of the distance from Quilimane t
of Nyassa, about 800 miles, could now be accomplish
exception of two small breaks. He had traversed
days, including five days of stoppages, and letters desp
north end of the lake were delivered in Edinburgh o
five days. There were like facilities for the transpo
delivered at the north end of the lake at about 30*l*. or
Quilimane. They had long ceased to consider thems
from the rest of the world, for frequent mails—abou
twenty years ago—kept them abreast of the times.
Lake Nyassa might now be considered as a convenien
reach the tribes in the regions beyond. The Tanga
sea at Quilimane as Ujiji was to Zanzibar. Last ye
only seventeen days, from the north end of Nyassa
of Tanganyika. The route was over an elevated,
country, and was by far the best and cheapest yet di
from Zanzibar to Ujiji occupied about six months, and
was about 400*l*. per ton. Comparing this with the ra
tages of that route into the Tanganyika became very
Africa could be done than by opening up this route i
During the last few months, Mr. Moir, of the Livi

travelling in the country to the north of Nyassa with the intention of visiting Marema and the Livingstone Mountains to the north and east of the lake. Next season, he (Mr. Stewart) intended to travel along the whole of the eastern coast of the lake, with a view of establishing a mission station on that side, and when that was done the map of Lake Nyassa would be complete.

Sir FOWELL BUXTON inquired whether the track pursued by Mr. Stewart between the two lakes could be made available for the use of animals, or whether porters alone could be employed; whether the district was affected by the fly, and whether there was any likelihood of wheeled traffic being established?

Mr. STEWART replied that the distance between the two lakes was about 210 miles, if the best route were adopted for a road. He found no tsetse fly in the district. No doubt a good road could be made, and very cheaply, considering that they would be working in the heart of Africa; but whether that work would be taken in hand shortly was not a matter he could decide.

Sir RUTHERFORD ALCOCK, on being called upon by the President, said the only ground he had for addressing the Meeting on that occasion was the circumstance that he happened to be Chairman of the African Exploration Fund Committee when this expedition was organised. The Society had just then experienced a heavy drain on its funds, through Captain Cameron's expedition, which had caused an expenditure of some 12,000*l.*, and they naturally felt some little trepidation in sending out another expedition to the centre of Africa. In Mr. Keith Johnston, however, they felt assured that they had not only a distinguished scientific geographer, full of enthusiasm, but a leader upon whose judgment they could thoroughly rely, and the expedition therefore appeared to be one which promised to be practicable without involving an enormous expense. Seeing that the International Association, of which the King of the Belgians might be fairly held to be the head, were about to undertake a large and costly expedition to pass from the east coast to the west, an enterprise requiring great resources, they thought it expedient to limit themselves to a minor undertaking, and to attempt the completion of two important links in the geography of the interior; these were, the route from the east coast opposite Zanzibar to the north end of Lake Nyassa, and the space between the north end of Nyassa and the south end of Tanganyika. That was the work carved out for Mr. Keith Johnston and his assistant, Mr. Thomson, then an unknown young man, except that he had excellent credentials as to his geological knowledge. The Society had been extremely fortunate in their selection. He was but a youth of twenty-two when he found himself suddenly called upon to head this expedition, and if he had not possessed the courage and a tenacity of purpose characteristic of his countrymen, he would probably have turned back. Instead of that, he went boldly forward; he knew that he would be trusted with the full confidence of the Society if he did his best, and he worthily performed the work that he undertook. He (Sir Rutherford Alcock) did not know that there had ever been a more successful exploration in Central Africa, or one more complete in all its parts, and Mr. Thomson had reason to be proud that he had brought back all the men he took save one who died, that he had not lost a bale of goods, and had never pulled a trigger.

The Rev. HORACE WALLER, in response to a request from the President that he would furnish the Society with some information about Chuma, said his first acquaintance with James Chuma was as a slave-boy in a slave-gang on the River Shiré. He was Dr. Livingstone's attendant for seven years, and, in company with Susi, at last brought the body of his master to the coast. Chuma also preserved Dr. Livingstone's diaries and other writings, and in this way he performed a most inestimable service to geography, because, they would all agree, that from

that march, phœnix-like, the subsequent expeditions l
Dr. Livingstone's explorations had been lost to the w
whether this enthusiasm for discovery would have got i
great was the dread of going into the interior of Afric
came to England, and was present at one of the meeti
glad to hear Mr. Thomson acknowledge the great val
he no doubt would be ready to admit that, left alon
the loss of his English leader, a very great deal of hi
pluck he found in James Chuma. He (Mr. Waller) s
setting forth from England were rewarded with medals
seen that the Society would always recognise merit, w
skin or a black one. A few pounds spent in rewardin
and properly bestowed, and would be beneficial in its r

The PRESIDENT said he was sure the suggestion
would not be lost sight of by the Council. Mr. Thom
praise from the person, of all others, best fitted to giv
Alcock. He would only add that Mr. Thomson had pr
countryman of those two illustrious Scotchmen who,
south, had added most to our knowledge of Africa
Dr. Livingstone. Englishmen would feel nothing but
great work done by Scotchmen, and they would be ver
of explorers they might soon be able to add the na
encouraged, as Mr. Waller had suggested, by rew
proceeding from this country.

A Visit to the Galapagos Island

By Captain A. H. MARKHAM, R.

THE Galapagos Islands, I may begin by stat
broad Pacific Ocean, almost on the Equator, a
from the west coast of South America. The
Spanish vessel, early in the sixteenth centu
from the word "galapago," which in Spanis
or land tortoise, the islands having abounded
Archipelago consists of seven principal island
of lesser size and importance, besides innumeral
which together occupy an area of about 180 sq

Albemarle Island is by far the largest in t
miles in length by about 15 miles in brea
mountains which tower up to an altitude of n
sea-level. Being of purely volcanic formation,
are nearly all conical.

The islets and rocks that fringe the coas
appear to be composed of a dark basaltic lav
are totally devoid of vegetation, sterile and
inhabited only by birds. Some of the higher o
are from 300 to 600 feet in height—appear to l

vegetation, just sufficient to give them a slight greenish tinge. Even this had a refreshing appearance to us, who had for so long been accustomed to gaze on the arid shores of Peru. The action of the sea has, by continuous attrition, so perforated some of these rocks as to cause the formation of perfect arches; this was more particularly the case in Watson Island, which exhibited two of these natural architectural features.

The majority of the hills on the different islands are the craters of extinct volcanoes, which, doubtless, at some probably not very remote period in the geological history of our planet, were belching forth sulphurous smoke and masses of incandescent lava—in short, in full volcanic activity. Darwin, who visited the Galapagos in 1836, whilst serving in the capacity of naturalist on board the surveying ship *Beagle*, under the command of Captain FitzRoy, affirms that there are no less than two thousand craters in the Archipelago.

Our stay in the group was of too brief a duration to enable us in any way to verify this statement; besides, our visit was limited to one island only. But from the appearance of the other islands, as we passed them at a distance, I should certainly hesitate to express an opinion contrary to that of such an accurate observer.

The same authority is under the impression that these craters were originally formed in the sea, and in support of this hypothesis he says that the southern sides, or lips, of the craters were invariably much lower than the remaining portion of the mouth. This he attributes to the prevailing southerly winds, which dashing the waves up against the sides exposed to their influence, gradually washed away the gaps that are now to be seen.

To the prevailing winds also may be ascribed the different aspects of the sides of the islands, the lee sides being comparatively bare and sterile in appearance, whilst to windward the islands were clothed with a dense vegetation. This can only be accounted for by the fact that the weather side first receives the moisture of the atmosphere, as it is wafted up by the trade wind, and its thirsty soil absorbs it all, before it can reach the opposite side. Hence the extra luxuriance of the verdure on the south-western sides, and the great contrast it offers to the sterility of the north-eastern shores.

So far as my limited knowledge of the group goes, I am of opinion that there are no active volcanoes in any of the islands at the present time, nor can I find any reliable information that would lead me to suppose that they have been in a state of activity since they were first discovered.* But with such an excitable neighbour as South America, distant only 600 miles, whose dormant volcanoes are only too prone

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* Lord Byron, H.M.S. *Blonde*, speaks of an eruption of one of the volcanoes of Albemarle Island, when his vessel was in Banks's Bay in 1825. An eruption in Narborough Island is mentioned by Captain Morell.—[ED.]

to burst forth into a state of violent commotion
provocation, it would not be at all surprising
that some of the craters had resumed activity.

The Archipelago belongs, politically, to th
By the government of that country, one or n
leased to a Señor Valdizan, who appears to have
tion of cotton, tobacco, and different kinds of f
but with what success we were unable to ascer
the island was found to be uninhabited, and in
of the so-called wild cattle (of whom more he
pigs, and other animals that had been left to r
ment of the island by the former inhabitants.
overrun with weeds and wild flowers, and the
ment were rapidly falling into decay. Barely
ever, had elapsed since those gardens were car
those huts were the happy homes of many fa
surely but silently testified by the inscription
grave, a sad but truthful record of the recent hi

The other islands in the group are suppose
at the time of Darwin's visit, forty-four years
were no less than three hundred living on Cha
being people of colour who had been banished fr
crimes. On James Island, Darwin found a part
been sent there from Charles Island for the pu
salting tortoise-meat.

With regard to the discovery of the Gala
really authentic information that I have been
they appear, with the present name of the gr
America and the South Sea, that accompanie
Ortelius in 1570; but I have not the slightes
discovered many years anterior to that work.

It is a curious fact that the individual n
islands now possess are all of English origin. E
thus known, or by whom the names were con
ascertain; but I am inclined to think that th
were bestowed by the buccaneers who, during t
frequented the islands, and made them a sort of
operations where they established large depots
they would go to careen their ships after a p
Spanish towns situated along the coast of South
raids were frequently extended as far north as t

Charles and James Islands are unquestionab
of that name of the Stuart dynasty. Indeed,
Archipelago, described in 1684 by one Ambro
they appear as King James and King Charles Is

Narborough must have been called after the celebrated navigator of that name, who, in the year 1669, was despatched by the Admiralty in his Majesty's ship *Sweepstakes*, on a voyage to the South Sea, partly commercial and partly for discovery.

The remaining islands of the group, namely, Chatham, Hood, and Indefatigable, appear to have been named at a more recent date. In Cowley's chart the last-named island bears the name of the Duke of Norfolk's Island. I cannot find out when or by whom the name was changed, but it is a very reprehensible act for anybody to alter the name of a place that has once been conferred upon it by its original discoverer. Cowley ignores the existence of Chatham and Hood Islands altogether, but he has a mysterious island situated due south of Albemarle and James, which bears the name of Sta. Maria de l'Aguada. This, I think, can be none other than Charles Island, which was probably reported by some inaccurate and obscure navigator to be in the position here assigned, and without further questioning it was inserted by Cowley in his chart.

The positions of the islands on this old and rather quaint specimen of cartography are, with regard to latitude, very fairly correct; but they are placed no less than 7° of longitude, equivalent to about 420 geographical miles, too far to the eastward. This appears to be a very egregious error, but due allowance must be made on account of the very primitive description of instruments in use in those days for taking astronomical observations whereby positions were determined.

The only reliable chart that we now have of the Archipelago is the Admiralty one compiled from the survey of Captain FitzRoy in 1836. Even on this we found our anchorage in Post Office Bay (so called from a custom the whalers had of depositing their letters in a hut on the beach for the first homeward bound ship to convey to their destination), differed no less than seven miles in longitude from the position as determined by us!

Captain FitzRoy, be it observed, was one of the most accurate and trustworthy surveyors in the Royal Navy, but then it must not be lost sight of that his chronometers in the *Beagle* were, in all probability, much inferior to those supplied to ships of the present day, and also that the *Beagle* had been a long time at sea, and therefore a considerable interval had elapsed since her chronometers had been rated. Whereas we had obtained rates for our timepieces at Payta, not more than two weeks prior to our arrival at the Galapagos, and we also had the advantage of benefiting by comparisons taken with no less than nine separate chronometers. The position, therefore, as now determined by Staff-Commander Covey of the *Triumph*, may, with confidence, be accepted as a true and reliable one.

Captain FitzRoy's survey of this extensive group of islands, although conducted in a sailing ship, subject to the irregular winds, calms, and

uncertain currents for which the neighbourhoo
verbially famous, was completed in the marvell
of five weeks. It is therefore not surprising th
of the islands, as shown in the chart, are slight
is a wonder that so much was accomplished, so
explored but surveyed, and so many miles of co
short an interval of time. Our visit to the isl
too brief to enable us to rectify any of these ina

The first mention of these islands having
have any knowledge, is when a party of buccan
of one John Cook, anchored off them on the 31s
the seventeenth century, the Pacific Ocean was
less men who, under the name of buccaneers, p
commerce along the coast, and even attacke
exorbitant sums would be levied to save them f

Darwin's interesting work, entitled a 'Natu
World,' contains undoubtedly the most comp
Galapagos Islands that, to my knowledge, h
During his stay in the group, extending ove
whilst the *Beagle* under Captain FitzRoy wa
survey of the Archipelago, he had ample oppo
natural history of this remote part of the world
assured, were fully taken advantage of by such
labourer in the field of scientific research.

Darwin's description of Chatham Island be
to the account given of one of the islands by
panied De Beauchesne. Darwin says, "The e
of the island seems to have been permeated, lik
ranean vapours; here and there the lava, whi
into great bubbles; and in other parts the t
formed have fallen in, leaving circular pits wit

There are few places in the world so remar
the Galapagos Islands, forming, as they do, a li
themselves, possessing their own distinct and
Most of the former are aboriginal creatures fo
the world, whilst with regard to the latter, the
species of plants that have never been seen any
a marked difference between the different spec
that inhabit the various islands comprising the
do not frequent the whole archipelago; tortois
on some of the islands, whilst on others they h
exist, and even the sea-fish caught in the water
the islands are washed, differ from those found

As Darwin very rightly and justly says,
pelago might be called a satellite attached to A

of satellites physically similar, organically distinct, yet intimately related to each other, and all related in a marked though much lesser degree to the great American continent."

The only way in which this great philosopher and naturalist can account for the remarkable difference in the individuality of the inhabitants of the several islands, and the way in which this individuality has been so strictly confined to the group, is by the fact of the strong north-westerly currents which prevail in the neighbourhood, which necessarily tend to make transportal by sea exceedingly difficult; and as the islands are, to a wonderful extent, free from gales of wind, birds, insects, or seeds could not well be blown from one island to the other. The profound depth of the ocean between the islands renders it extremely unlikely that they were ever united, and from their appearance it is reasonable to suppose that they were formed by volcanic upheaval from the bed of the ocean.

The Galapagos Islands are now but rarely visited (being out of the track of merchant ships) except perhaps by a stray whaler, or occasionally by an English man-of-war. It was therefore with a great deal of pleasure that I received Admiral Stirling's orders to shape a course in H.M.S. *Triumph* to this interesting group, and although our visit was but of brief duration, and confined to one island only, still in the short time that we remained in Post Office Bay, Charles Island, we had ample opportunities of exploring the island, and adding slightly to our limited knowledge of its natural history. The onerous duties on which we were engaged prevented a longer stay in the group, otherwise a more valuable collection would undoubtedly have been obtained, for the majority of the officers showed a praiseworthy zeal and energy in collecting specimens, whilst a great deal of interesting information would also have been gained in connection with these remarkable islands. A large ironclad, however, like the *Triumph*, drawing 27 feet of water, is hardly the kind of vessel that should be selected to cruise amongst a group of islands only partially surveyed.

The climate of the Galapagos Islands, considering their situation, is far from being uncomfortably hot, and there is generally, during the day, a cool, refreshing sea breeze. During our short stay in the group, in the month of February, in the very height of what is called the rainy season, but little rain fell, and that principally at night-time. Two days before we reached the islands, and when we were some 200 miles to the eastward, we experienced an unusually heavy fall of rain, lasting in one continual down-pour for many hours.

On approaching the group, and also during our sojourn at Charles Island, we saw an immense number of turtles lying on the surface of the water, but all attempts to capture them were futile. Either they were too wary or we too stupid, or perhaps a combination of both, but they invariably raised their heads out of the water, looked curiously

and inquisitively at their approaching enemie
below the surface long before the boat could
tance. It is customary to spear or harpoon the
on the water, but they were always too wide a
saw any on shore.

On account of the heavy rollers that set in,
and dangerous surf the western coast of Char
boat, except at a few sheltered places, is almost i
anchorage is, undoubtedly, in Post Office Bay, i
It is open and exposed to the westward, bu
prevailing wind by Daylight Point.

Off some of the headlands, especially those v
tions, hundreds of sea birds were congregated
boats, close to the rocks on which they were as
regarded us with dull apathetic wonder, seemi
our presence. The terns, however, showed a
to the indifference displayed by the larger frat
with fierce, harsh cries our intrusion, and kept
in our boat, so that we were compelled to use
whereby several fell victims to their own rash

In the bay there was no dearth of fish, p
weighing from 15 to 25 lbs. each. These were
and line, as they were so voracious that they
and swallow, the bare hook, before even a piece
to it. The chief annoyance from which ou
the number of small sharks, who, apparently b
would seize the bait intended for their brethre
thus immolate themselves through their own r

Darwin reports that the tortoises on Charle
of the *Beagle's* visit, were so numerous that t
chief staple of food by the inhabitants, who c
generally collect in a couple of days sufficien
(who mustered about 300) in provisions for a
that some men landing from a frigate, a few
to the beach in one day no less than 200 to
either from drought or some other cause, m
astonishing manner during the last few years,
be said to have ceased to exist on Charles I
on the island, although different parties from
about in various directions, the only sign of a t
was the shell of a dead one in the vicinity of t

Lizards also, were exceedingly scarce, a few
more than two, I think, were captured. Th
remarkable genus met with nowhere else in t
confined to the Galapagos Islands. I was fo

one of the marine kind, the *Amblyrhynchus cristatus*, which measured 31 inches in length. The terrestrial one, the *Amblyrhynchus Dumerilii*, has never, I believe, been found in Charles Island, though common enough in other islands of the group. Its habitat appears to be confined to the central portion of the Archipelago. My specimen has a short, broad head, and is of a dark brownish colour, striped with yellow across the back; its feet are partially webbed and are furnished with five long claws; the tail is long and flattened at the sides. It bears no resemblance to its ally the iguana, either in appearance or habits, for it is of a very sluggish nature, and may be caught with ease.

The shores of Charles Island, and I presume they form a very good illustration of what the coasts of the other islands are like, are a mass of rugged lava, heaped together in chaotic confusion. I can think of no better simile than that they resemble a newly ploughed field which had suddenly become solidified, except, perhaps, that I should feel inclined to say that the clods in the Galapagos were larger and the furrows and crevices deeper.

Some idea may be gathered of the roughness of the beach when it is known that a party of explorers started to walk from the ship along the coast to the settlement, a distance of about four miles. After abandoning the greater part of the provisions and stores with which they were laden, and cast off all superfluous clothing, they succeeded in accomplishing the distance in about ten hours. But at the end of this time their boots and shoes were completely worn through, some even being sole-less, their scant clothing was torn into shreds, whilst they themselves were exhausted.

In order to reach the settlement on Charles Island, without undergoing a repetition of the experiences of the energetic pedestrians just alluded to, it is advisable to land in a boat at a place called Black Rock Beach on the western side of the island. The best landing will be found on the beach, in front of a dilapidated hut in a snug little bay protected by outlying rocks. Beyond is thick, dense scrub, through which paths radiate in various directions. These paths were simply cattle-tracks, unpleasantly narrow, and in some places almost undistinguishable, from the exceeding density of the bush. The latter, on account of its prickly and thorny nature, was terribly fatal to clothing.

These thickets have been described by former visitors as being "leafless." We, on the contrary, found them clothed with a luxuriant verdure; but this apparent discrepancy between our experiences and that of those whom we followed, may possibly be due to the time of year that we visited the islands, the rain, in all probability, having materially assisted in developing the growth of the plants. The bush consisted chiefly of a species of *Euphorbiaceæ*, but acacias and other trees were abundant. These were probably indigenous to the island, but we also saw a vine, fig, and orange trees, besides lime and lemon trees,

which I think must owe their introduction t
Grasses were exceedingly scarce, which appe
ing the vast amount of wild cattle that f
This was subsequently partially accounted f
contents of the stomachs of some of these anim
unable to detect any traces of grass, and cam
these beasts lived entirely on the rank weed w
over the island.

Gradually ascending from the beach and jou
a walk of about a mile and a half brought us
was only so in name, for no settlers, or even
occupation, could be found. There stood the
as still and silent as the tomb, a silence that w
birds which fluttered around us fearless and
these, that they even alighted on our gun-b
with them over our shoulders.

The settlement consisted of about half a
thin strips of split bamboo, connected togethe
of raw hide. The majority of the houses wer
one, more pretentious than its neighbours, poss
iron. A small stream trickling from a spring
settlement relieved our anxieties regarding
pleasant and refreshing, though slightly war
served to allay the excessive thirst produce
walk. When the island was visited by Darw
was situated about two miles from the site of
the ground was reported to be well cultivated
bananas. Of this latter plant we saw no sig
palms, or other vegetation peculiar, exclusivel

I must not omit to mention the existence
bearing tree which, in all probability, was i
inhabitants. It was a description of plum, a
the Spaniards "*Ciruela.*" I am inclined to
Darwin's *Guayavita.* It bore a rich yellow-colo
dark-red on its maturity. It possesses a v
juicy, and has a slightly tart, but by no means
men ate great quantities of this fruit when th

The interior of the island was covered wi
that we had encountered on landing, and whi
cost, was quite impenetrable if we ventured
tracks. Although some of our party ascende
island, which was over 1700 feet above the leve
explored the interior, we failed to discover
country," or to see "the rich grass under our
greeted with the many "varieties of flowers,"

visitor in a graphically written work depicting sporting adventures in the Pacific. Perhaps, as I have already hinted, Charles Island is clothed in different garbs at different seasons of the year.

During our excursions we found the heat, in the middle of the day, to be intense, whilst we invariably suffered from an intolerable thirst, which we were only occasionally able to allay when we were fortunate enough to come across a few dirty pools of stagnant water, in which the cattle had been wallowing, that existed in a valley separating the two highest hills on the island. In one of these ponds a teal and a curlew were shot. They were, apparently, the *Querquedula Crecca* and the *Numenius arquata.* A duck was also seen, but at too great a distance to be properly distinguished.

Having walked about five miles into the interior, we observed what appeared to be a succession of caves, symmetrically dug out, at the base of a hill. On approaching, a truly wonderful sight presented itself to our eyes. The cavities we found to be natural excavations in the lava similar to those seen and described by Darwin on one of the other islands of the group, and formed, as he supposes, by the subterranean vapours permeating through the soft lava whilst yet in a state of fusion, and producing gigantic bubbles, which, bursting, formed the caves we saw.

These dens, which is the most appropriate term I can use for them, had evidently been utilised by the former inhabitants both as residences and cooking places, traces of fire being still plainly discernible. In some, the half-consumed ashes were visible. Some of these excavations took the form of roads, having natural walls on either side from 8 to 10 feet in height. I never in my life saw a place so admirably adapted by nature for defensive purposes. A small party of resolute men in possession could with ease defy and keep at bay more than twenty times their number.

In the vicinity of this weird-looking place was a secluded and shaded grotto, around which grew in luxuriant profusion clusters of various kinds of ferns, whose graceful fronds waved over a bright, sparkling stream of pure pellucid water, which trickled down with a musical murmuring from the rocks above. It was a sight to soothe and delight the eye, as we approached nearer to inspect this beautiful glen, and to moisten our parched throats with a draught from the glittering rivulet.

Two or three large orange trees, fully 20 feet in height, were growing in the neighbourhood, their well-laden branches affording an excellent protection from the sweltering rays of the fierce tropical sun to which we had been exposed. So fruitful were these trees that it caused one of my companions to observe, very truthfully, that their boughs contained more oranges than leaves. But what attracted our attention, even more than the natural beauties of the scene, and rendered the

picture almost offensive and repugnant, was the accumulation of v
numbers of skeletons and carcases of oxen, in different stages of dec
position and decay, that lay heaped about in all directions, and filled
air with a loathsome and nauseous odour. In a small plot of gro
barely a square acre in extent, there could not have been less t
300 carcases. My impression is that the locality was where the w
cattle were accustomed to assemble daily for water, and that, at s
no very distant date, the stream which had afforded us such a refresh
draught had in all probability dried up, and the unfortunate bea
unable to find water elsewhere, had accumulated at the place where t
had been in the habit of alleviating their thirst, and finding noth
but a dry bed of a watercourse, had perished miserably.

Whilst meditating over the scene, we were disagreeably aroused f
our reverie by the sudden onslaught of a couple of large black bo
whose jaws were furnished with extremely ferocious-looking tu
They rushed out from a cave alongside of us. So sudden and un
pected was the charge, that although they passed within a couple of
of us, they, as well as ourselves, who nimbly stepped on one side s
not to interfere with their headlong career, escaped unharmed, the c
rifle that we had pertinaciously refusing to go off at the critical mom
although levelled with deadly intent at both animals.

Darwin refers to the existence of pigs and goats on Charles Isl
but we saw no indications of the presence of the latter animals.

Shortly after the "pig scare" we disturbed a litter of about si
seven yellow-coloured puppies, which, emerging from another ca
slunk away up the hill with their tails between their legs, resembl
more a lot of well-thrashed, and therefore well-cowed domestic anim
than the offspring of wild parents. Although at times during the
we fancied we heard the older dogs barking, we never succeede
seeing them.

The dogs were no sooner disposed of than we suddenly found
selves face to face with two of the famous wild cattle of the island,
savage ferocity of which had been the topic of many discussions
the subject amongst my shipmates during our passage across from So
America. They were a couple of noble looking bulls that faced
but, unfortunately for them, the rifle this time was more true than w
aimed at the pigs, and they both fell victims. During our stay in
Galapagos, although a great many of these animals were seen, only
fell to the prowess of our hunters.

I have been unable to ascertain satisfactorily the date of the in
duction of these cattle on the island. I am inclined to think tha
was during the present century, and probably within the last th
years. There were certainly none in the islands during the days of
buccaneers, or else some mention would undoubtedly be made regar
the existence of such a staple commodity of food; nor were there an

1836 when the *Beagle* visited the group, for according to Darwin the tortoises furnished the inhabitants with food.

I am almost disposed to attribute their introduction to the late tenant, Señor Valdizan, who appears to have been an enterprising man, and whose remains lie interred in the neighbourhood of the settlement of which he was the originator and proprietor. Although they appeared, as a rule, in rather poor condition, some that we saw were splendid looking animals of great size. They were of all colours, black, brown, white, red, and brindled, which in a measure tends to prove their recent domestication.

There are also a great number of donkeys on the island, which were probably allowed to run wild in order to preserve their own lives when the place was deserted about eighteen months ago.

The bush during the day was alive with little birds, mostly of a dull and sombre-coloured plumage, with two exceptions, namely a beautiful little scarlet-tufted fly-catcher, with a richly coloured breast of the same bright hue, and a lovely little yellow wren, the male of which possessed an orange-coloured head. Indeed, animal life in the Galapagos Islands appeared to assimilate itself as much as possible to the dull and rather dismal colouring of the lava of which those volcanic islands are composed.

On account of the excessive heat, the difficulty of preserving specimens was greatly enhanced. Birds had to be operated upon almost immediately they were killed, whilst plants and flowers withered and faded a few hours after they were culled. Our natural history collection was in consequence not so large, or so valuable, as it would otherwise have been.

The breeding season for the birds in the Galapagos does not appear to be confined to any particular period, but seems to extend over the whole year. Our visit to the islands must naturally be inferred as having taken place in mid-winter, for we arrived there in the middle of the rainy season. Yet we found nests, apparently just formed, others containing eggs in different stages of incubation, and others with the small unfledged birds inside, whilst young birds just able to fly were frequently observed. In fact, all the various gradations, from the immature egg to the mature bird, were observed at the same time.

A large peculiar kind of locust, of a highly variegated colour, abounds in the island. These insects were about four inches in length and were quite as large as some of the small birds that flitted about in the bush, for which they were not unfrequently mistaken. We obtained a large description of humble bee, several kinds of beetles and cockroaches, some dragon flies and other insects. Of butterflies we only saw three distinct kinds, but moths were very numerous, and of several different descriptions. The latter were seen flying about just as much during the day as at night time. A number of shells, both marine and terrestrial, were also collected.

We failed to see any of the flamingoes which are reported to be, more or less, common to the group; nor did we observe any of the buzzards alluded to by Darwin, and which, if indigenous to Charles Island, we should most certainly have found gorging themselves on the carcases of the oxen. Nor did we observe any of the skuas and gulls said to frequent the group by Mr. Howard Saunders, in his interesting pamphlet on the geographical distribution of those birds, published in the 'Transactions' of the Linnean Society.

One of the most interesting natural history specimens that we obtained was a fresh-water lobster, which was found in a small pool fed by the spring that has been mentioned as being in close proximity to the settlement. The creature was of a greenish colour, and its body was about six inches in length. It was in possession of six legs, and had four feelers or antennæ, besides two enormously long, thin claws fully 18 inches long. The claw itself was furnished with two or three sharp teeth. Unfortunately during the transit of this specimen to the ship, and before it could be placed in spirit, it was in such an advanced state of decomposition that it was thrown overboard. This odd-looking crustacean was found in a small and shallow pool, not more than three feet in diameter, and only two or three inches in depth. It was secreted under a stone, and would have remained undiscovered, and consequently unmolested, had it not been for its pugnacious disposition in attempting to seize with its claw the hand of one of the men who had gone to the stream for ablutionary purposes. The pool of water in which its capture was made was fully a mile and a half from the beach, and 450 feet above the level of the sea.

The finding of this creature would cause us to draw the inference that in spite of the insignificance of the stream, for it was only an exceedingly small rivulet, water is to be obtained all the year round; in other words, that the stream never dries. This is of the utmost importance to those who are desirous of residing on the island.

The currents in the vicinity of the group are strong and very uncertain; necessitating extra caution on the part of the mariner navigating those waters. To the southward of Hood Island we experienced a strong westerly set of no less than 2½ knots per hour in the space of three hours, whilst during the four succeeding hours the strength had diminished to 1·4 knot per hour in the same direction. Previous to making the islands we had experienced strong north-westerly and north-easterly currents, and the same was the case after we had left them, the ship being set in one day as much as 66 miles to the north-west.

When about 100 miles to the eastward of Chatham Island, several temperatures were obtained at a depth of 300 fathoms. We found a difference of nearly 10° of temperature between the surface water east and west of the group, the latter being the coolest. FitzRoy, in the *Beagle*, found even a greater difference. Whilst cruising amongst the islands he observed the temperature of the water, as we did, to be at or about 80°, but directly he went to the westward of Albemarle Island, it suddenly fell to 60°. The time of the year was October. This cold stratum must be a branch of the South Polar current which had not had time to be heated by its diffusion with the equatorial stream.

Off Charles Island a haul with the dredge in 45 fathoms was obtained, but with unimportant results, by which we concluded that there was a great paucity of organic life at the bottom.

The Archipelago is still far from being well known; a visit to its unfrequented shores of a few months' duration would amply repay any naturalist, by the rich harvest he would reap in the collecting of specimens, both animal and vegetable, that are totally unknown in any other part of the world.

Notes on Captain Markham's "Visit to the Galapagos Islands."

By Osbert Salvin, F.R.S., F.L.S., &c.

Some of Captain Markham's collections having been placed in my hands for determination, I gladly return to a subject in which I was actively interested a few years ago, and take the opportunity here afforded me of adding a few words to the foregoing paper, on the subject of the gradual increase of our knowledge of the fauna of the Galapagos Archipelago since Mr. Darwin's memorable visit.

Of indigenous terrestrial mammals none are known to exist in any of the islands, but before passing to the birds it seems desirable to recall the fact that a species of sea lion (*Otaria*) was once common in the Galapagos. In the accounts of various visitors to the islands at the end of the last and beginning of the present century, allusion is not unfrequently made to the numbers of *Otaria*, but I have seen none in recent records. It seems therefore most probable that these animals were exterminated by the crews of the whaling ships which thronged these seas prior to Mr. Darwin's visit. The Galapagos *Otaria* is usually supposed to be the same as that found on the coast of California; but this point has, I believe, never been satisfactorily determined, and specimens of this animal and bones of it, especially crania, should be carefully sought for by future explorers.

The birds of these islands have always received a large share of attention, and hardly any expedition has failed to add some species to the list. After the visit of H.M.S. *Beagle*, the French ship *Vénus* touched here, and the surgeon, Néboux, obtained two species of sea birds, a gull and a petrel, both of which proved to be new to science and peculiar to the islands. Captain Kellett and Lieutenant Wood in H.M.S. *Pandora*, also secured some sea birds near Chatham Island, one of which I long afterwards described as a new and peculiar petrel, and another was a second, and to this day only other known, specimen of Néboux's gull. After the *Pandora* the Swedish vessel *Eugenie* spent nine days amongst the islands, during which time twenty-six species of birds were procured, and amongst them a new heron and a new penguin, the latter having been seen and incidentally mentioned by Colnett, who observed it at James's Island, when there in H.M.S. *Rattler*, in 1794. In 1868, Dr. Habel, an American, spent about six months in the Archipelago, having joined a party of "ochilla" pickers. During this time he made by far the largest collection of bird-skins ever got together in these islands. His chief attention was devoted to Indefatigable, Bindloe, and Abingdon Islands, none of which had previously been visited by a naturalist. This collection fell to my lot to work out, and I took the opportunity of collecting all the previous information relating to the birds that I could obtain, and incorporated it with Dr. Habel's notes in a paper, published in the 'Transactions of the Zoological Society.'* The number of species there shown to inhabit the islands, was fifty-seven. Since then I am not aware that any additions have been made to the number of birds, but the few specimens obtained by Commander Cookson in H.M.S. *Peterel*, added to our knowledge of their distribution. Captain Markham's collection, which contains fifteen specimens of ten species, adds another petrel (*Puffinus obscurus*) to the list. *Pelecanus fuscus* and *Sula cyanops* are traced to Charles Island, though both are probably found throughout the Archipelago. A single mutilated specimen of an *Anous*, allied to *A. stolidus*, is much darker than is usual in specimens of that bird, and the few feathers remaining on a fragment of the head show that the crown is not light grey, but coloured like the back. Mr. Sharpe separated the Galapagos bird as a species distinct from the well-known "Noddy," and this specimen tends to show that he was right in so doing.

From these notes it will be at once seen that even in the comparatively well-worked field of the birds, we have reason to believe that much remains to be done before they can be said to be at all completely known. Not only are the important islands of Hood, Tower, and Albemarle almost untouched, but outlying rocks such as Wenman and Culpepper ought not to be wholly neglected, as it is impossible to surmise what they may contain or what novelties may be in store to reward a diligent explorer. Then, too, the sea birds are perhaps more interesting than those of almost any part of the world. For, with several common and widely ranging species we find no less than four or five which are peculiar. Two gulls, both very rare in collections, especially merit attention; even more so the two petrels, which are peculiar to the islands, and amongst the rarest of their kind. The doubtful distinctness of the Noddy tern also requires further investigation, and more specimens are required to determine its position.

* Vol. ix., part ix.

Our knowledge of the reptiles has been greatly extended in recent years, chiefly through the exertions of Commander Cookson who, at Dr. Günther's request, paid great attention to the remarkable tortoises which in these islands have ever attracted notice. These materials Dr. Günther incorporated with all the previous information he could obtain in a valuable memoir, published by the Trustees of the British Museum, 'The Gigantic Land-Tortoises (living and extinct) in the collection of the British Museum.' From this it would appear that the tortoise of Charles Island (*Testudo ephippium*) is extinct.

Abingdon Island has a peculiar species in *T. Abingdoni*, and in Albemarle two species are found, one in the north (*T. microphyes*) and another in the south (*T. vicina*), but the latter point is somewhat doubtful. Besides these, another species exists (*T. nigrita*), but which has not yet been satisfactorily traced to any one island. Nor is the exact origin of *T. elephantopus* known, though supposed to be James Island. On the other hand, Chatham Island, Hood Island and Indefatigable Island, though all known formerly to have possessed tortoises, now probably contain nothing but their remains, but even of these not even fragments have reached our museums. With the exception of Albemarle Island, where tortoises are still numerous, and Abingdon Island, where a few may be found with tolerable certainty, nowhere else throughout the Archipelago have we any recent accounts of their survival. What is required of future explorers is the search in each island not only for the few lingering individuals that may still survive, but for any remains, such as bones, especially crania and carapaces, that are sure to be lying about, and probably will continue to do so for some years to come. But no time is to be lost, for, after the extinction of these animals which must ensue in a short time, all traces of them must follow at no distant period.

Of the five known species of lizards, Dr. Steindachner has recently given an excellent account in the 'Festschrift der Zool.-bot. Gesellsch., Wien,' for 1876.

Of fish, the most recent additions are given by Dr. Günther* from Commander Cookson's collection, that officer having obtained twelve species during his visit in H.M.S. *Peterel*, five of which were new to the fauna of the islands.

The only recent collected notes on the Invertebrates that I am acquainted with are those prepared for Dr. Günther's paper on Commander Cookson's collections,† and with them are incorporated descriptions of many of Mr. Darwin's specimens here formally noticed for the first time. Of Mollusca, 22 species are mentioned; of Crustacea, 4; of Myriopoda, 1; of Arachnida, 7; of Neuroptera, 2; of Lepidoptera, 2 (both Heterocera); of Orthoptera, 6; of Hemiptera and Homoptera, 18; and of Echinodermata, 5. Captain Markham now adds nine species of

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* 'Proc. Zool. Soc.,' 1877, p. 64, *et seq.*

† Ibid.

Lepidoptera (three butterflies and six moths). Of these I have prepared a short paper for the Zoological Society. The butterflies are: an *Agraulis* closely allied to the common American *A. vanillæ*, but dwarfed in size and slightly modified in colour; a true *Lycæna* or *Polyommatus* which seems peculiar, though a closely allied species is found in Peru; the third is a dwarfed race of the common American *Callidryas eubule*. Of the moths, five of the six species are Sphingidæ, three being barely separable from widely ranging American species, differing only in their smaller size, the other two are apparently distinct species to which I have not yet been able to find near allies. The sixth species is an obscure Geometrid.

As regards the general relationship of the fauna of the Galapagos to that of the Continent of America, to which it bears so strong a resemblance, it seems only necessary for me to refer to Mr. A. R. Wallace's recently published volume on 'Island Life,' in which Chapter XIII. is especially devoted to this subject. Captain Markham's collections in no way tend to modify the conclusions there arrived at and so carefully worked out: that the Galapagos are strictly "Oceanic Islands," and owe their fauna and flora to the gradual immigration of species from Continental America. This immigration has been going on from the time when these volcanic islands first emerged from the ocean, and the disintegration of the rocks provided soil for the growth of plants which in their turn nourished insects, seeds, birds, &c. With the lapse of time, and the altered conditions amid which surviving species have found themselves, modifications in their form and colour have been accumulated at a comparatively rapid rate, and this result has been fostered by the peculiarly calm climatic conditions of the islands, and the strong ocean currents which set through them, serving not only to isolate the Archipelago from the mainland, but even, to some extent, the islands from one another.

Lest it be thought that in introducing so much on zoological subjects into a geographical journal I have trespassed too much upon more legitimate matter, I will in conclusion again turn to Mr. Wallace's most instructive volume, and quote from his final paragraph, where he speaks of the conviction, that ever presses upon him, of the complete interdependence of organic and inorganic nature, and adds "not only does the marvellous structure of each organised being involve the whole past history of the earth, but such apparently unimportant facts as the presence of certain types of plants or animals in one island rather than in another, are now shown to be dependent on the long series of past geological changes—on those marvellous astronomical revolutions which cause a periodic variation of terrestrial climates—on the apparently fortuitous action of storms and currents in the conveyance of germs—and on the endlessly varied actions and reactions of organised beings on each other."

Correspondence relating to Commander Cheyne's Scheme of a North Pole Expedition.

In accordance with the arrangement made on the occasion of the reception by the President, Lord Aberdare, of a deputation from the Central Arctic Committee, on the 12th of October last, a statement of the scheme proposed by Commander Cheyne has been since sent in on behalf of the Committee. This was laid before the Council of the Society on the 22nd of November, and after due consideration a reply directed to be sent. The statement and reply are as follows:—

Central Arctic Committee Room, Imperial Buildings,
Ludgate Circus, London, E.C., 12*th November*, 1880.

Sir,—I have to request you will be good enough to lay the enclosed document before the President and Council of the Royal Geographical Society at your earliest convenience.

I am Sir,
Your obedient Servant,
Newton R. Gordon,
Hon. Secretary of the Special Committee formed for drawing up and forwarding the Statement requested by the President and Council of the Royal Geographical Society.

Statement.

The delay in responding to the invitation of the President and Council of the Royal Geographical Society to a deputation of gentlemen interested in Polar research to forward a statement respecting the proposed Polar expedition, has been occasioned by several causes, chiefly by the absence of Commander Cheyne, who has been engaged in balloon experiments.

The undersigned have now much pleasure in handing in the statement asked for by the President and Council of the Royal Geographical Society.

Other countries are carrying on expeditions to the Arctic Regions, and it is most desirable that England should occupy a prominent position in the determined effort to reach the Pole, which is now being made.

It is believed that an expedition which would be attended by valuable scientific results might be carried out at a moderate cost, and that the same reasons now exist for Polar explorations as led to the despatch of previous expeditions, both under Government and due to private enterprise.

The proposed scheme is as follows:—

Commander Cheyne and a party of men, provided with a small steam-launch, materials for building a hut, the necessary boats and sledges, and provisioned for three years, will be sent to St. Patrick Bay in a whaler sailing from Dundee in the spring of 1881. The vessel will call at the Greenland settlements to obtain natives and dogs; the necessary instructions to that effect having already been forwarded from Copenhagen, and Commander Cheyne will be supplied with one or two balloons, which ought to prove useful auxiliaries for the purpose of observation.

The winter quarters of Commander Cheyne and party will be in the immediate vicinity of the seam of coal between Discovery Bay and St. Patrick Bay. With such an inexhaustible supply of fuel, it is evident that the safety and comfort of the party will be greatly promoted, and besides this, there will be found the means in abundance of generating the hydrogen so preferable for inflating the balloons.

It is believed that Commander Cheyne could, in the following spring, with boats and sledges, reach the Pole; and the remarkable journey of Lieutenant Schwatka, who was absent from his base 11 months and 20 days, during which time he travelled 2819 geographical, or 3251 statute miles, shows what determined men can do in the Polar Regions, and strongly confirms the undersigned in the belief of a successful issue to the Polar journey of Commander Cheyne.

The return to England would be *viâ* the Danish settlements; and that this may be safely effected has been proved by the wrecked crew of the *Polaris.*

The undersigned are fully alive to the valuable aid which can be rendered by the Royal Geographical Society, and they will be glad to learn the intentions of the Council on this point at their earliest convenience.

John C. Bailey,
E. A. Collier,
Henry Coxwell,
F. Duncan, Major R.A., F.R.G.S.,
T. Rupert Jones,
R. E. Henry,
W. H. Hudleston,
B. W. Richardson,
Bedford C. T. Pim,
D. Smith,
W. S. W. Vaux,
James Wyld,
W. T. Charley, Knt., Q.C., D.C.L.

To the Secretary Royal Geographical Society,
1, Savile Row, W.

Reply of the Council of the Royal Geographical Society.

1, Savile Row, *November 23rd*, 1880.

Sir,—I am directed by the President and Council of the Royal Geographical Society to acknowledge the receipt of your note of the 12th instant, and of the Statement which forms an enclosure to it, describing the details of Commander Cheyne's scheme for Polar discovery.

In reply, I am to state that the Council has taken special interest in Polar discovery from the first foundation of the Society, and especially since 1865, and that all expeditions which appear to contain the elements of success and of usefulness have always had, and always will have, the cordial support of the Council.

The President and Council, however, regret that, in their opinion, the scheme, as explained by the Statement, does not commend itself to them as one of that character, nor, even if it were feasible, do the means proposed to be adopted for encountering the great dangers and difficulties necessarily attendant upon such an enterprise appear to them sufficient.

I am, Sir,
Your obedient Servant,
H. W. Bates,
Assistant Secretary.

Newton R. Gordon, Esq.

GEOGRAPHICAL NOTES.

The African Exploration Fund.—The East African Expedition, sent out originally by the administrative committee of this fund, having been brought to a successful termination by Mr. J. Thomson, the Council of the Royal Geographical Society have decided to close the accounts of the Fund and dissolve the committee. The total subscriptions to the Fund for the three years during which it has been in existence amount to 3989*l.* 18*s.* 1*d.*, of which 2000*l.* have been contributed out of the general funds of the Society. Out of the small remaining balance an honorarium of 250*l.* has been voted to Mr. Thomson, in consideration of the ability and completeness with which he has carried out the objects of the Committee. A handsome sword, with suitable inscription, and a silver medal are to be presented to Chuma, the head of Mr. Thomson's caravan, and a second-class sword and silver medal to Makatubo, the second head-man; and a bronze medal and certificate of conduct, bearing the consular seal, will be given to each of the 150 native followers. The President, Lord Aberdeen, has been requested by the Council to write a letter to Dr. Kirk, Consul-General at Zanzibar, thanking him in their name for the important services he has rendered throughout to the Expedition. A report embodying the above will be, in due course, issued to the subscribers.

Dr. Holub's new African Expedition.—We have received from the Geographical Society of Vienna the circular which they have just issued, appealing for subscriptions in aid of the fresh expedition which Dr. Emil Holub proposes to undertake into Central Africa. It is Dr. Holub's intention to start from some point in Cape Colony, and at once to push forward to the Zambesi, where he desires to complete the exploration of the Marutse-Mabunda country, which was interrupted on his first journey by the wreck of his boat and the loss of his stores. That done, he will cross the water-parting between the Zambesi and the Congo, and then visit the little-known sources of the latter river. His next step will be to make an attempt to solve the important geographical problems connected with the River Welle; after which he will make his way through Darfur into Egypt. Dr. Holub expects that this expedition through the African interior, from south to north, will occupy three years, and that a sum of rather more than 5000*l.* will be required to defray its cost.

Captain Carter's last March in Central Africa.—We have been favoured by the family of the late Captain Carter with the following extracts from his diary, commencing with his departure from Karema and ending on the morning of the day when he was struck down in the attack made by the chief Mirambo on the fortified village of Kasogera. As the route taken by Captain Carter on leaving Karema is to some

extent different from that followed by Mr. Tl
some new and interesting geographical da
crossed Thomson's route about 10 miles sou
station of Gongwé (*vide* Map, p. 784). Kasog
the eastward of Gongwé:—

"KAREMA.—On 4th June [1880] was joined by

"On 13th June started together from Karema, ma
through grass even on the mountains 8 feet high; b
fired by the natives; scenery park-like. Plenty goo

"On 15th passed high peaks on right. Large timbe
wild hemp growing; reached place called Marimba,
bad water; food for elephants in dry season; once
tsetse fly in thousands. From 10.15 A.M. until 1
hollow, thought large drums were beating, but, on s
was the men's footsteps on the hollow ground tha
village called Tapuaday, Sultan Katagara; the bom
and earth thrown up 8 feet above level of ground; al
poles dropped between, making height of boma 10 f
2 P.M., passed village Masambay, close to small riv
into Tanganyika. Food plentiful and cheap; camp
ash trees. Cadenhead ill with fever.

"*Wednesday*, 16*th June*.—Cadenhead ill in bed
thermometer 55°, 6 A.M.

"*Thursday*, 17*th*.—Bitterly cold morning; passe
mountains; very heavy dews at night, and grass hig
on us; Cadenhead carried in hammock bed. Thous
mad. On passing River Fuma we entered Mongway
from it.

"*Friday*, 18*th*.—Weather cloudy and cool; pass
Tanganyika, about 25 feet broad and, in high season
about 1 foot of water in it. On mounting last spur of ra
as they are called, saw great plain of Kitawe stretch
Hills bear N.W. by W. Level of plain, bar. 27·14,
Path strewn with granite stones, making walking ve
of food for elephants in this village at all times of th
R.G.S. passed this village en route for Simba. This
with moat all round.

"*Saturday*, 19*th*.—4.50, turned out the hands, bit
of Kokongu, Sultan Mkwawa; obliged to camp, as
ahead for 6 hours; a river, called Kongu, flows clos
into the Lake, or marsh, Chada.

"*Sunday*, 20*th*.—9.15, came to a small lake
evidently three marshes in wet season. 1 P.M., arrive
Kafufu [Mkafu] River, this river is the outlet of Lake
Livingstone's body was carried through here. Sult
send a couple of men with two of his to the *Great*
[Kasogera] by name, to announce our coming. This
not let us pass till he got permission from Kasegar
Kwikura.

"*Monday*, 21*st*.—Started for Lake Chada, after
came to a small lake, evidently deep, as no lilies on it

There are evidently a number of small lakes forming the outlet of Lake Chada into River Kafufu, a deep and rapid river flowing into the Rikwa. The Lake Chada, which they describe as a very large sheet of water, runs up close to "Gongwe," from where we now are on this small lake. Natives say it is six hours' march to the big lake. Men returned from Kwikura and say sultan will be delighted to see us.

"*Tuesday*, 22*nd*.—Crossed River Msaria, which comes from Mount Fipa and flows into Kafufu River, which empties itself into Rikwa. The river where we crossed flows W. and E.; sandy bottom, good water; about 35 feet broad and 8 feet deep in high season, now there is only 2 feet at deepest part. Road all day has been running parallel to Fipa Mountains, or as they call them here, Ruba el Fipa. Drew up in sight of Kasegara's great town to wait for stragglers. Close to village, wuzier of sultan came out to meet us, and conducted us to hill close to village, where we might camp. The men are fine-looking fellows, ears pierced like the Wagogos, and heads shaved in several fantastic ways. The only water to be got here is out of a hot spring in the village. Busy settling hongo all day. Kasegara wants a lot of cloth and a rifle, says if we were Arabs would make us pay over 100 doties, as the Arabs have behaved badly in taking his ivory and promising payment when they got to Unyanyembe and then ignoring their debt altogether.

"*Wednesday*, 23*rd*.—Settled hongo, 18 doties of cloth and old French gun worth 6*l*. Sultan said he hoped we would send a flag with an aceda from Said Burghash. The wood for miles round has all been cut to make a new boma or fortification round Kasegara's large town, as he is expecting a visit from the great Mirambo, who has, he says, joined with Simba to make a raid on him. Mirambo seems to be ubiquitous; he is everywhere and in every one's mouth. The women frighten their children with his name to make them keep good. Natives crowding into camp as cannot get wood to make boma. Sultan sent messengers to me, saying Mirambo was at the River Msaria, that we crossed on 22nd, coming to attack us, and that we must at once move into the boma. Sent him word that, as we were peaceful travellers, we had nothing to do with his or Mirambo's affairs, and that I must march in the morning. He sent back word that if we did not move into his boma he would know we were with Mirambo, that our coming only a day before him looked suspicious, and that if we did not prove by moving into his boma that we were not with Mirambo and Simba, he would attack us and make us move in. Assembled all my head-men, and, with one voice, they said it would be madness to refuse to go into boma for one night, as the sultan had sworn if Mirambo did not attack us before morning he would let us go. He laid his gun on the ground, drew his finger through the dust across his gun and then across his throat; this they tell me is an oath seldom broken by a savage. I then assembled all the men and asked them if they were afraid to stand by me, they said no, but that as we were completely cut off from water, which was inside of town boma—had no boma of our own, and last, but not least, as our guide was in the hands of the sultan, being one of his subjects—they thought it would be madness for us to stay where we were, and would be better to move into the town for one night. Pointed out to them that in my opinion it would be for probably a month (not one night), as the sultan evidently wanted our guns on his side, that when we once got inside the boma we were like rats in a trap, and entirely in the hands of the sultan, as he had 2000 armed men to our 120. They said it cut both ways, we in camp without water, boma, or guide, the sultan could chaw us up whenever he liked; told them thought this very unlikely, &c., &c. I told the sultan's wuzier not to make a mistake, as I would not allow a gun to be fired in defence of his town, &c., &c. At last, about 7.30 P.M., half the village turned out, yelling and screaming, and set fire to grass all round their boma, so they really expect Mirambo and Simba's men to attack them to-night. The men advanced in a most excited state; told my men to stand to their guns, which they did in a half-hearted way. I told Abdullah not to speak to wuzier until his men drew back, as we were not to be coerced by fear. He immediately ordered his men to draw off. Cadenhead and I decided that, though against our own judgments, we were forced to go into the town, so at 9 P.M. we struck camp after five hours' jaw, and entered the town sorely against my own judgment. Wuzier also said that if Mirambo's men attacked and murdered us within sight of his own boma, that he would be disgraced for ever and a lot of bosh of this kind, that if Mirambo did not turn up before morning he would send an escort with us to see us safely to the end of his district. Nothing else for it, though it does go hard against the grain to be forced to do what I know is against common sense.

"*Wednesday*, 23*rd* (? *Thursday*, 24*th*).—6 A.M. Sent Abdullah to sultan, saying we wanted to start according to his promise, it is now 8.30 and he has not come back. Sent him word, I think it would be better for me to go and have it out in person with the sultan. He sent back word for me not to go, that he hoped it would soon be settled, so I fear much we are in durance vile until Mirambo's men beat this brute or he beats them, for he will not part with us as long as he thinks Mirambo's people are near at hand.

"Their boma is strong, but it would take about 5000 men to defend it properly, as it is much too large. Outside their boma there is an earthwork thrown up right round for the sharpshooters to lie behind, so these savages seem to know what's what; well, they have lots of experience, as, I believe, continued fighting goes on here from all reports. The men are well armed, mostly with old Brown Besses, but I saw several long Enfields also."

Here the journal ends, and from the account given by some of the natives who afterwards reached Zanzibar, it would appear the attack was made by Mirambo on the same day.

Recent Items of News regarding African Explorers.—A telegram has reached Alexandria, announcing that Dr. Matteucci has succeeded in traversing Wadai, and is pushing northwards to Tripoli; Prince Giovanni Borghese returning to Cairo by way of Dongola. A letter has also reached Italy from Lieutenant Massari, Dr. Matteucci's scientific coadjutor, written on September 4th, from the little village of Abu-Gheren, which the expedition originally reached on July 2nd. From this letter it may be gathered that the difficulties* met with on the eastern frontier of Wadai had been materially smoothed over by the intervention of the Egyptian authorities, owing to whose action the Sultan of Dar-Tama had sent his son to conduct the expedition to his residence, a day's journey distant from Abu-Gheren. There they were to wait until they heard whether the King of Bargu would give them permission to pass through his territory, and if the telegram above referred to be correct, this would appear to have been granted.—News has reached Alexandria of the release of the Italian traveller, Captain Cecchi, who left Shoa more than two years ago, in company with the late Signor Chiarini, on a journey to the equatorial lake region, but was seized and detained in confinement in a small district tributary to the King of Shoa.*—By the last mail-steamer to Zanzibar, a third detachment, consisting of seventeen missionaries, was despatched by Mgr. Lavigerie, Archbishop of Algiers, to East Africa to reinforce the stations already formed by the Algerian Missionary Society on the northern sides of Lakes Victoria and Tanganyika.—By a letter which we have just received from Mr. St. Vincent Erskine, dated Kokstad, East Griqualand, August 20th, we learn that Mr. Pinkerton, an American missionary, had just left for Umzila's country, for the purpose of establishing a mission-station on the highlands near Tshamatshama (E. long. 32° 31′, S. lat. 20° 22′).† This expedition has, no doubt, been undertaken in pursuance of a suggestion made by Dr. Means to the American Board of Commissioners for Foreign Missions, that this region, known of old as Monomotapa, was the second best site for a mission station.‡ The Rev. W. W. Bagster left London at the end of September on his way to West Africa, where he is about to found the principal mission station of the Board on the Bihé plateau.—A serious misfortune has happened, according to recent news, to our Associate, the Rev. T. J. Comber, whose persistent efforts to reach Stanley Pool from San Salvador we have several times adverted to. Messrs. Comber and Hartland are stated to have been entrapped by an urgent invitation to visit Makuta, where they were savagely attacked and ultimately fired at; both were injured, and one of them somewhat seriously by a bullet wound received while escaping.—M. Paul Soleillet, who left Bordeaux in July to renew his attempt to reach Timbuktu from Senegal, has so far again been unsuccessful; it is, indeed, stated that, owing to some misunderstanding with the French Colonial authorities, he has been ordered to return to France.—The Italian Government have promised a grant of 800*l.* in aid of a project of commercial exploration in Africa.

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* *Ante*, p. 691.

M. Mushketof's Ascent of the Zarafshan Glacier.—M. Mushketof, who has for a long time been occupied in the geological exploration of Central Asia, has recently made the ascent of the Zarafshan Glacier which had not been previously explored, and the summit of which he found to be at an altitude of 9000 feet. M. Mushketof tells us that the people who live at the foot of the glacier, known by the name of Galchas, are of an entirely distinct type. They are direct descendants of the Persians, and their civilisation is of a primitive kind. They do not engage in agricultural pursuits; and their houses and household utensils are of stone. A Galcha village bears no resemblance to a Russian village; for it consists of a long row of tumbledown houses, built of stone without lime or cement. In regard to domestic animals,

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* *Ante*, pp. 318, 508.

† See Mr. St. Vincent Erskine's account of his Journey to Umzila's (with map of Gaza country), 'R.G.S. Journal,' vol. xlv. p. 45.

‡ *Ante*, p. 45.

the Galchas have only the *ischak*, a kind of wil
a beast of burden. They make all their jou
excellent pedestrians. Although living near
never been there, partly because they see no
from such a journey, and partly because they
sible. They have a legend that two pillars, w
the approach to the glacier, and immediately
whoever ventures near it. Consequently, it
entreaties and presents that M. Mushketof wa
the natives to accompany him in the ascent, whic
of August. The slope of the mountain is ex
every step immense blocks of stone and morai
very beautiful effect is produced by the lowe
which there forms a symmetrical arch or vault,
River Matcha, in a deep and rapid stream.
more than two-thirds of a mile into the inte
arriving at the summit, the expedition examine
found there no trace of snow or ice; several
they contained only muddy water; higher up, h
which was as clear as crystal. On the follo
entered on the region of eternal snow and ice;
met with, but were easily crossed. The second
midst of the ice, and the difference between
perature was found to be very great. In th
registered (in the sun), and at night 21° and ev
end of the fourth day the expedition reached
did not present any great difficulties, but owi
the air, breathing was found difficult, and so
glacier is oblong in shape, measuring 16 miles
mile in breadth. Six lateral glaciers join on
each of which surpasses in dimensions the gl
summit forms an immense amphitheatre, open
mountains, and the view from it is imposing
west, some of which are 20,000 feet high, app
air, while their bases are hidden in the clouds.
much more difficult than the ascent, chiefly ow
two of the Cossacks narrowly escaped being
returned to Tashkent on the 30th of August.

Russian Explorations in Western Siberia.—M
tific mission to Central Asia, &c., we have
recently sent to the French Geographical S
interesting information respecting two Rus
started during the past summer from the capi
General Kasnakof, the Governor-General, despa

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* *Ante*, p. 252.

a topographer, to explore the northern part of the Tobolsk government, which was previously almost unknown. M. Khandachefsky followed the course of the River Obi from Tobolsk to Obdorsk on the Arctic Circle, and then ascended the River Polui, which falls into the Obi not far from Obdorsk ; he left the Polui in 70° E. long. in order to follow the valleys of the Nadym and the Amukdalu. At a point where Petermann places the northern limit of forests, in the valley of the former river, he discovered a magnificent forest of cedars and larch of great size. In his return journey M. Khandachefsky crossed the unknown region which is at present a blank on the map, and followed approximately the seventy-third meridian to Surgut, whence he made his way back to Omsk. His journey has also had interesting scientific results, for among the Samoyedes of the Obi estuary he found some idols made of stone, and not of wood, which are the only specimens of the kind met with up to the present time. In consequence of this journey, General Kasnakof has conceived the idea of founding a colony in the valley of the Nadym, in order to turn to profitable account the rich forest discovered by M. Khandachefsky ; but this project has not yet been carried into effect, owing to the Governor-General's enforced absence from his post through serious ill-health.—M. Balchashine, a member of General Kasnakof's staff, has also recently been sent across the Kirghiz Steppe in Turkistan, to study the ethnography of the country, and to ascertain the practicability of forming a carriage road over the steppe. He travelled by the post road to Akmolinsk, from which place he visited the basin of the Nura and the Sari-su valley, following a south-westerly direction, and traversing the eastern side of a small desert, near a Kirghiz settlement named Jitti-Kossur. He afterwards journeyed to the south through the Bekpak-dala steppe, crossing the River Chu not far from its mouth at the Saumal-kul, and reached Susak by the northern slopes of the Kara-tau Range. He then crossed the mountains to the city of Turkistan, and followed the post road to Tashkend. In addition to his ethnographical researches among the various Kirghiz tribes, M. Balchashine has established the practibility of making a carriage road between Akmolinsk and Russian Turkistan, and this discovery will probably have an important bearing on the choice of a route for the projected railway through Central Asia, which would thus bring the great administrative centres of Omsk and Tashkend into communication with the mother country, besides developing the resources of the Kara-tau oil region.

M. Yadrintsef's Journey in Eastern Siberia.—In the Russian papers which have just reached us, we find an account by M. Yadrintsef of his expedition into Eastern Siberia. On August 14th he says his party reached Kashagatch, a Russian factory some 33 miles from the Chinese frontier, after experiencing great difficulty in ascending the mountains, the elevation of which is 6000 feet, and in which they observed numerous cataracts. They met with some interesting archæological remains, in

the Bashkous and Uligane valleys, beyond whic
by the Chuis tribe, which up to 1862 paid tri
to China; these people appear to be in n
primitive condition, but are stated to be excell
starting-point of a steep road, which is the on
into China and Mongolia. M. Yadrintsef says
condition, and being the only means of com
Uliassutai, and Hami, ought certainly to be
Before leaving these regions, the expedition in
of the Altai range.

Forests and their Destruction in Northe
report to the Foreign Office, Her Majesty's V
calls attention to the fact that the vilayet, in w
is remarkable for the extent and excellence of i
forest tracts are found on the mountains a
northern range, around Duztche Boli and on
range. The best timber growth generally occur
the mountains, where the damp sea-breezes, a
afforded against the heat of the sun in summ
and make them less liable to conflagration.
pitch-pine and firs flourish, while on the lowe
chestnut, plane, hazel, and many other tr
In the more cultivated portions walnut trees
grow to a large size: the loupes, or walnut bu
article of commerce. Boxwood is also found i
an article of export. Unfortunately there ar
wood-cutting is carried on anywhere, and much
miscuous felling, and by the extensive fires, w
weeks together, destroying magnificent tracts
indeed, there is a tax on wood-cutting, but it i
forests yield only about 7000*l.* annually to th
An inspector, with subordinate officials, has rec
perhaps some check may thus be imposed on
hitherto prevalent. Mr. Kitchener also notes
of the vilayet is very large; coal, copper, a
worked, but the industry is not in a satisfact
the want of roads and the maladministration of
It may be interesting to add that much inf
region will be found in Mr. William Ainsworth
to Angora, which was published in the ninth
Journal (pp 217–276).

Russian Surveys in Turkey during the
Järnefeldt has contributed to the 'Russische Revue' a
geodetic, and topographical operations carried on by the
insula during the years 1877, '78, and '79. Our previou

the country was based on the work of the Russian surveyors who during the years 1828–1833, covered an area of 110,000 square versts in Moldavia, Wallachia, and part of Northern Bulgaria, with their astronomical and topographical operations. Half a century has, however, since passed, and during that time fresh settlements and towns have sprung up, and old ones have fallen into decay; new roads have been laid down, and the face of the country has been greatly changed through the unsparing felling of the forests. During this interval no opportunity has presented itself for resuming operations, though from time to time reconnaissances, route-surveys, and travel notes, have been published, which have sufficed to show that the older work had in many respects become obsolete. Accordingly, on the outbreak of the recent war, two surveyors were attached to the staff of each army corps, and seventeen to the general staff, while forty surveyors were summoned from Finland, Kurland, and Bessarabia for detailed surveys of the scene of war, including *inter alia* a complete survey of the Balkan range, its spurs, passes, and valleys. The first important work consisted in the determination by telegraph of the differential longitude of Kishinef, Jassy, Galatz, and Bukharest, to which was added that of Sistovo, after the transit of the Danube had been effected. The difference in longitude of Giurgevo and Bukharest was fixed by chronometric measurement, and a survey of a part of the tract between the Jantra and the Lom was completed, as well as plans of Nikopolis, of the environs of Sistovo and Simnitza, and of the places where the crossing of the Danube took place. After the arrival of the forty surveyors mentioned above, the execution of the detailed surveys was left to them, under the direction of General Järnefeldt, while the triangulation was intrusted to Colonel Lebedef. In 1877 operations were very much hindered by cloudy weather, rain, frost, and snow, and by sickness among the troops. Nevertheless, the triangulation and topographical survey of the country between the Danube and the spurs of the Balkans, and extending from the Jantra in the east to the Vid and Plevna-Lovatz road on the west, were completed. The military operations of the winter enabled the scope of the surveyors' work to be enlarged, and advantage was taken of this to increase the strength of the surveying staff. At the beginning of the year 1878 ten persons were detached for triangulation and astronomical observations, forty-four for the detailed survey of Western Bulgaria on the one-verst scale (1 : 42,000), forty for the survey of Eastern Bulgaria on the same scale, and eight for reconnaissances and triangulation in the Dobrudsha. The strength of the military topographical section of the army in the field remained the same. Glancing at the detailed results, we observe that the entire area of the present principality of Bulgaria and of Eastern Rumelia has been covered with a network of triangulation, while on Turkish territory (i.) series of triangles were carried from Yambol and Mustafa Pasha to Adrianople, and from thence by way of Chorlu to Constantinople, and from Kirkilissa to Burgas, and (ii.) the whole space between Adrianople, Dedeagatch, and Rodosto has been studded with trigonometrical points. All the geodetical determinations originate from six bases, from 3 to 5½ versts in length, measured in the vicinity of Widdin, Turna-Magurelli, Kustendje, Kustendil, Philippopolis, and Burgas respectively, and carefully connected one with another. Across the Balkan range eight series of triangles were run from north to south, and connected at numerous points, these being so closely set that there is not a single spot in the whole range which is more than 25 versts distant from a trigonometrical station. The Rhodope and Rylo mountains have been similarly surveyed. In all, 1287 principal points have been fixed, and the heights of nearly all these positions have been determined in addition, the data being derived from four sea-level marks on the shores of the Black Sea, viz. Kustendje, Baltchik, Varna, and Burgas; two on the Sea of Marmora, at Silivri and Rodosto; and one at Dedeagatch, in the Ægean. A copious list of heights

in the Balkan and Rhodope Mountains has already l
being Jumrukchal (7791 feet) in the former range.
position of which was determined astronomically amo
graphical survey of Eastern Bulgaria was conducted u
Shdanof. It comprises the eastern portion of Bulg
small slice off the north-east of the Turkish territory s
outturn of work by this party during the two year
versts surveyed, and about 5000 square versts re
Dobrudsha. The surveys executed by the officers o
Western Bulgaria comprise two districts. The first in
territory, embracing the towns of Midia, Adrianople,
an obtuse angle between the Black, Marmora, and Æg
on the two-verst scale, while the remaining portion
east were surveyed on the one-verst (1 : 42,000) scale.
of the area between the rivers Tundja and Arda as
and all Bulgaria and Eastern Rumelia lying westward
area covered by the surveyors here amounted to 78,
verst scale and 640 square versts on a larger scale, a
Sofia, Widdin, Tirnovo, Philippopolis, and Rachovo,
Shipka Pass. The number of heights determined in
57,300 in all. General Järnefeldt enters upon a
of numerous topographical corrections which the rec
and from these it appears that errors of 10 versts in
very common. Summarising the different results, w
versts were surveyed on the one-verst scale, and 23,
verst scale, while complete materials exist for the co
Balkans on the ten-verst scale.

Affluents of the Purûs.—Writing from S
July last, to the South American Missiona
Thwaites Duke gives an account of a further
of the Rio Purûs,* which he undertook in t
the dwellings of the Indians known to exis
Mr. Duke first entered the Içumia, and after a
with deep water, found the channel blocked
obliged to pass through the *igapó* (flooded allu
nine feet of water. He encountered much diff
overhanging boughs and branches submerged
the deceptive nature of the forest-covered b
to tell to which side the course of the river
to the bends, and this difficulty was increased
being full of the sharpest turns, some of wh
plete circle, with a diameter of about 60 yard
The water of the river differs very much from
it appears of a dark brown colour, but in a
The scenery, though circumscribed, is very c
Duke writes, " a watery avenue, enclosed on
of the most luxuriant foliage, in which every

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* Cf. *ante*, pp. 570–2.

the deepest indigo to the palest yellow, varied at intervals by the rich brown of some tree soon about to burst forth again into verdure—with here and there a tree clothed with the most delicate pink blossoms, here and there an air-plant, with its large cool leaves, nourished at such a height one wonders how. Notice how faithfully it is all reflected by the dark water beneath, except where a fish has risen or a passing breeze has ruffled its surface." Eventually, however, the Içumia was found to narrow very much, and so many sunken trees were met with, that it was not deemed prudent to take the steam-launch further, and the party were compelled to return to the Purûs without having reached the Indian settlements. Mr. Duke next ascended the Mamuriá affluent, in company with Sr. Braz Gil de Encarnação. This river, though much wider, and not so tortuous as the Içumia, presents nearly the same appearance, except at some of the bends, where there appear miniature *praias* (sandy beaches) of very fine, white sand. On the sixth day some shallows were reached, covered by about three feet of water, and it was not thought safe to take the *Pioneer* over them, as she might not have been able to get back again. Mr. Duke, accordingly, proceeded two miles further up in a canoe with Sr. Braz, in the hope of finding some indications of the whereabouts of the Jamamady Indians, but could not find any; the river appeared to continue as before, about 15 yards wide and 12 to 15 feet deep. In returning they rowed into an affluent of the Mamuriá, narrow at the mouth, but soon expanding to almost the dimensions of the main stream. Here they found a landing-place of the Jamamadys, where they were supposed to have passed a week previously. Although the forest on the right bank of the Mamuriá is intersected in all parts by hunting paths, indicated by twigs bent down in a forward direction at about waist high, Mr. Duke found nothing sufficient to guide him towards the permanent dwelling-place of the Jamamadys. He intended, however, to make an excursion up the river by canoe with Sr. Braz during the summer, when they will probably find large numbers engaged in fishing on the beaches. Mr. Duke mentions that the Mamuriá is supposed to connect with a canal or river called Cuniwa, which is said to empty into the Tapaua, an affluent of the Purûs, considerably lower down. The Mamuriá, which is believed to rise very near the head-waters of the Juruá, had not been, previously to this expedition, ascended for more than a few miles from its mouth.

REPORT OF THE EVENING MEETINGS, SESSION 1880–

First Meeting, 8*th November*, 1880.—The Right Hon. Lord Aberdare,
President, in the Chair.

Elections.—*Robert Bayly, Esq.*; *William Callow, Esq.*; *Herbert Collier, E*
Charles Cooper, Esq.; *George Henry Drew, Esq.*; *Charles Richard Fenwick, E*
Major-Gen. W. A. Fyers; *Colonel Richard Harrison*, R.E., C.B.; *Wilfred Po*
Esq.; *Sir Charles Farquhar Shand*; *S. S. Thorburn, Esq.*

The President, in opening the Session, apologised to the Meeting for hav
prepared no written address. The custom of delivering a written address, howe
as he had been informed, was one which had come into practice only of late ye
having originated in the latter part of the presidency of Sir Roderick Murchis
and been continued by his successors; but, for several reasons, he (Lord Aberd
had ventured to depart from that practice. The first, perhaps, would be accepted
a sufficient one, which is, that during the last month he had been engaged, he mi
say, night and day (for he worked all day and travelled all night), in a very labori
inquiry into the higher and intermediate education in Wales, exercising both m
and body in such a manner that he could hardly be said yet to have recovered fr
the exertions. But a still better reason existed in the fact that, at the annivers
meetings in May, an annual address, reviewing all the proceedings with which
Geographical Society has been connected during the previous year, is deliver
leaving little necessity for reviewing the events happening during the few we
of the summer vacation. But even with reference to those events, the Fellows
this Society have delivered into their hands, by the monthly publication of
'Proceedings,' a full and accurate record of all that has taken place of geographi
interest. If he could speak on these subjects with the authority possessed by ma
of the former Presidents, some of whom were now present, he might trouble the
probably with some review of the progress that geography had made during t
time; but not having had the practical experience of those eminent men, he prefer
to make only a few brief observations. The last annual address, in May, review
all the principal events interesting to geographers up to that time. Since then,
explorations, at least, of very great importance, had been concluded; one of th
that into Central Africa, to the neighbourhood of Lakes Nyassa and Tanganyi
the Meeting would hear described that evening from the lips of the explorer hi
self, in a manner infinitely more interesting than even the most gifted Presid
could present them. His predecessor, Lord Northbrook, bestowed a well-meri
eulogy upon Mr. Thomson for his courage and determination in carrying on
expedition after the lamented death of his leader, Mr. Keith Johnston.
the members probably already knew, the objects of that expedition have b
fully carried out, but few could know at what expense of determination,
what suffering, and with what skill. It was not for him to anticipate, but
fact of great interest and importance might be mentioned, as it is not c
tained in Mr. Thomson's paper; it is this, that Mr. Thomson traversed
less than 2830 miles of country during these explorations, and of those upwa
of 1300 were over entirely new ground. He would further venture to
that none of the expeditions in which this Society have borne a part, had b
marked by greater courage, by greater skill, or by greater success than t
As great courage, no doubt, as great skill, had been shown upon former occasio
but he thought that when Mr. Thomson sat down it would be evident to
his hearers that there were in this expedition circumstances which distingu

it from even the most remarkable of its predecessors. Upon these he would not now enlarge, except to say that they were all to his credit, and he thought would go greatly to the furtherance of what we all have at heart—the thorough knowledge and the gradual civilisation of Central Africa. The other exploration which he had to mention was one which had been brought to a conclusion far more successful than the bold adventurer himself who embarked upon it would probably have expected. This was the expedition of Mr. Leigh Smith to the north Polar Regions. Mr. Leigh Smith spends his summers, not as most of us do in the various pleasure grounds of Europe, but among the icebergs and the tremendous floes of the Arctic Seas. By pursuing a route explored indeed before, but in a direction in which no very great progress had been made, Mr. Leigh Smith has been able to add materially to our knowledge of the Arctic Seas. He has advanced in his ship further than any ship has hitherto advanced in the direction of Franz-Josef Land. The members had been made aware, no doubt, of the awakened public interest that has been recently manifested with respect to Arctic exploration, and especially towards what is called the "discovery" of the North Pole. An important deputation presented itself during the vacation to himself and the Council of the Society. Into the immediate objects of that deputation he would not now enter; suffice it to say that it was proposed to continue the exploration in a similar direction to that taken by the last expedition sent out with the assistance of the Government, by Smith's Sound. Another direction indeed was proposed as a simultaneous one, or possibly as a substitution for the other in case of difficulties that he (the President) did not clearly apprehend; but there was no question whatever that the discoveries of Mr. Leigh Smith would compel the serious consideration of the Arctic Committee of the Society that has inquired into these matters, whether the prosecution of discoveries in that direction may not be most safely conducted in the direction of Franz-Josef Land, the knowledge of which had been so much extended by Mr. Leigh Smith's last adventure. He (the President) was happy to announce that a paper, drawn up with the co-operation of Mr. Leigh Smith, on this subject, would be read at one of the Evening Meetings, at as early a date as practicable. But before then—at the next meeting of this Society on the 22nd instant—he had the very great pleasure of announcing that the Society would be addressed on a subject of the greatest interest, that is, on the Geography of Temperate South Africa, as a basis for further exploration in Central Africa, by Sir Bartle Frere. He (the President) did not know whether he could venture to assume that there were very many in the audience who had, as he felt it his duty to do, read through the very numerous Bluebooks relating to the affairs of South Africa during the last year or two, but those who had done so would be aware that over and above the interesting and important details in matters political and military into which those Bluebooks enter, there are others of infinite interest to geographers, describing the expeditions of various officers under the direction of Sir Bartle Frere into the regions which lie between the north of the Transvaal and the Zambesi, and of very interesting discoveries made with respect to various peoples, and the characters of those who ruled over them. He, the President, had no doubt, from what he had read in those Reports, that Sir Bartle Frere would give us an account full of valuable information regarding those regions. His (the President's) only fear was that if he established too strongly his case, he would give some justification to an alarm which he knew was spread by an eminent diplomatist throughout the European mind on the subject of our advances in South Africa. He was told by one of the most eminent diplomatists now in Europe, that he was greatly pressed to explain the objects of our annexation of the Transvaal. He told me that to have told them the real truth, to have told them that it was forced upon two reluctant Governments, and that it was forced upon them with a view to preventing possible disasters which would lead to bloodshed and danger to the whole the South African colonies, would have been to have subjected himself to scorn incredulity and ridicule; so he thought it better to give them an answer m in accordance with their preconceived opinions, and he told them that we h occupied the Transvaal with a view of making a step towards the possession Egypt. That explanation was received as the most natural and probable explan tion in the world. He had no doubt Sir Bartle Frere, in dealing with this subje would tell us a great deal that is true and interesting without reviving the alarms f in Europe on account of the advance of British power in that direction.—Such w the subjects that would occupy them between this and Christmas. After Christm a paper of great interest would be delivered by Mr. Delmar Morgan on his rece scientific expedition to Kuldja; and still later, an address will be delivered by Richard Temple on Southern Thibet. The President concluded by saying that we h now arrived at the fiftieth annual session of the Society, and he thought it might said without exaggeration that every year had seen its growth in material prosperity, authority, and in the respect with which it is viewed by kindred societies througho Europe. It had contributed greatly to the spread of geographical knowledge, a consequently of civilisation; and he had no doubt that great as had been its strid during the last fifty years, they would be exceeded by what would be done in t fifty years to come. It was a wide-spread impression, existing mostly among t ignorant, that there was little more to discover in the world; but geographers kn what great tracts there are in various parts of the world that remain still unknow or that have still to feel the beneficent influence of a higher civilisation. That mu would be done in the course of a very few years, mainly from the labours of su men as he who was now about to address the Meeting, he had little doubt.

Mr. Joseph Thomson then read his paper entitled—

"Journey of the Society's East African Expedition in 1878–80." *Vide supr* p. 721.

The discussion which followed is given *ante*, p. 740.

PROCEEDINGS OF FOREIGN SOCIETIES.

Geographical Society of Paris.—October 15th, 1880: M. A. Grandidier the Chair.—Extracts from the voluminous correspondence accumulated during t vacation were read, including a letter from M. Desgodins, missionary in Tibet, w announced that he was approaching the completion of his work on the Tibet language, having finished two dictionaries, one French-Latin-Tibetan, and the ot Tibetan-Latin-French; and another from M. Ledoulx, French Consul at Zanzib reporting on the considerable results of the English expedition under Mr. J. Thoms who had arrived at Zanzibar, and also on the deaths of Captain Carter a Mr. Cadenhead.—Dr. Harmand then addressed the Society on the subject of t anthropological researches of Dr. Neïs in Cochin-China, regarding which he h received late news. Dr. Neïs had been commissioned by M. Le Moyre de Ville Governor at Saigon, to visit the Moës tribe of savages living in the north-east of t colony, and make a special study of their physicial characters and customs. M. Duveyrier read extracts of two letters received from M. Revoil, at Aden. T traveller states that the English authorities at Aden had given him a very friend reception. Captain Hunter, the Political Resident, who is at present compiling, wi the aid of the missionaries of Monsignor Taurin, a Somâli grammar and a treatise the Somâli races, had kindly given him proof-sheets of these works. M. Revoil l

Aden on the 11th September for Marayah, in the Mijjertain country. He was preceded by couriers to prepare a hut for his first station, and had engaged among other Somâlis his old servant Ali Farah. He contemplates staying two months at Marayah, making botanical and zoological collections in the maritime districts. Afterwards he will proceed to Karkar, and pass there the rainy season, before going forward to the Dolbohantes and Uyadines, the road thither being impracticable at that season, as the Nogal overflows its banks, forming an immense lake and marshes, and driving all the native shepherds to the higher lands.—A letter was read from M. de Ujfalvy, written at Omsk on the 24th of September. Postal communication having completely ceased between Orenburg and Tashkent, this expedition has been forced to take the Siberian route to reach Turkistan, travelling *viâ* Semipalatinsk, Serjiopol, and Chemkent. Madame de Ujfalvy accompanies her husband and his party of savants.—Recent information regarding the progress of M. Marche in the Philippines, Dr. Pavy in Smith Sound, and Dr. Crevaux in South America, was also communicated to the meeting.—Coloniel Perrier, of the Institute, then addressed the Society on the subject of the mission just left for Senegal, charged with the task of making a thorough exploration of the region between the Upper Senegal and the Niger, with a view to the proposed railway. It is placed under the direction of Commander Desbordes of the Marine Artillery, and the party will be accompanied by 700 men for the protection of the surveyors and to help in constructing a chain of fortified posts along the route.—Dr. Ballay announced that M. Savorgnan de Brazza, after establishing a station at the junction of the Pasa and Ogowé, and leaving there two Europeans, has started for the Congo. On the 14th of July he was on the line of water-parting between the Congo and the Ogowé. Dr. Ballay intended in the course of a few days to sail for West Africa, in order to rejoin his former travelling companion. M. Mizon, of the French Navy, who has been appointed by the International Association to establish a new station up the Ogowé, will sail with him. M. de Brazza had engaged 750 men for the service of this expedition, who would be waiting at the mouth of the river. They will ascend as far as the Alima, taking with them in canoe the sections of a steam launch. The President, on the termination of Dr. Ballay's communication, which was received with great applause by the audience, spoke as follows: "It is unnecessary for me to call the attention of the Society to the importance of the journey which MM. Ballay and Mizon are about to undertake. This expedition will open to science and civilisation one of the most interesting regions of Africa, and one which has a special interest to us as Frenchmen in being the borderland of one of our own colonies. The success already achieved by Dr. Ballay in the same country will be a guarantee of future triumphs, and we sincerely wish him success in his enterprise. Although the mission intrusted to M. Mizon by the French section of the International Association will not take him so far in the interior, his task is no less full of interest, for it is on him we depend for a complete knowledge of the basin of the Ogowé, its products, resources, and natural history, as well as its geography."

——— November 5th, 1880: M. A. Grandidier in the Chair.—The Chairman announced the death of the well-known cartographer, M. Erhard, and stated that he had bequeathed to the Society the sum of £6 per annum to found an annual prize. Among the letters read to the meeting was one from M. L. Hugo, on the subject of a commercial museum organised at Brussels by the Belgian Ministry of Foreign Affairs; and another from M. van Maanes, from Java, respecting the discovery of a method for treating and preparing China-grass. A letter was next read from M. Ledoulx, French Consul at Zanzibar, on the present condition of European exploring expeditions in East Central Africa. He reported that the last expedition of the International African Association, under Captain

Ramaeckers, was in a state of partial disorganisation through fever at the end of April. The leader was himself ill, and M. de Meuse, the photographer, had been obliged to leave his companions and return to the coast. He informed M. Ledoulx that he had left Captain Bloyet, the head of the station now being formed in East Africa by the French branch of the same Association, seriously ill at Kondora. Mr. Hore, the London Missionary Society's agent at Ujiji, had sent down to Zanzibar various articles belonging to the late Abbé Debaize. M. Ledoulx mentioned the arrival of four English missionaries, one of whom was to remain at Zanzibar, while the others were preparing to join Mr. Hore at Ujiji. In a postscript, dated September 10th, he added that he had just received intelligence that Captain Ramaeckers and M. Le Leu had almost completely recovered from their illness, while Captain Bloyet's condition gave cause for much anxiety.—In a letter dated Omsk, September 25th, M. de Ujfalvy gave the Society some information respecting two journeys of exploration during the past summer.* One of these, conducted by M. Khandachefsky, has made us acquainted with the northern part of the government of Tobolsk as far as Obdorsk, at the head of the estuary of the Obi; while by the other, M. Balchashine has found that a practicable road for carriages can be made between Akmolinsk and Turkistan.—M. de Quatrefages afterwards brought to the notice of the Society the wonderful discoveries made by M. Desiré Charnay in Mexico. In the ruins he has explored M. Charnay has found numerous remains of a very remarkable industry. In the ancient city of Tula, for three centuries the capital of the Toltecs, he has excavated some houses and palaces communicating by labyrinthine passages. At Tula M. Charnay found Japanese earthenware and porcelain, as well as glass and worked iron, that is to say, remains of industries hitherto believed to have been entirely unknown there. He also met with bones of large ruminants and horses, though it is known that at the time of the Spanish conquest the only large ruminant, and that not domesticated, was the bison, and that the horse did not exist there. The children's toys found represent miniature chariots, which goes to prove that the animals named must at the time have been in a domesticated state in the country. All these facts throw a new light on the history of these regions, and on the arrival of the numerous cases expected from M. Charnay, at the Muséum d'Histoire Naturelle, the precise bearing of his discoveries will be ascertained, as well as the date to which these remains must be referred.—The General Secretary then read a letter written from Para on October 10th by M. Ch. Wiener, French Vice-Consul at Guayaquil, announcing that he has just crossed South America in its widest part, his route throughout lying between the equator and 3° S. lat. In returning to Guayaquil M. Wiener hopes to be able to ascend the Huallaga affluent of the Amazon, and cross the Cordilleras to the north-west of Jaen.—Dr. Harmand announced to the meeting that he had commenced a course of lectures at the Musée des Colonies on the geography, geology, climatology, anthropology, fauna and flora, &c., of French colonies.—M. Simonin afterwards read a paper on the Tyne and the Clyde, which will appear in the Society's 'Bulletin.'

Geographical Society of Berlin.—October 9th, 1880: Dr. Nachtigal, President, in the Chair.—The President opened the meeting, the first after the summer recess, by a few words of greeting to the numerous members present, and more particularly to Professor Bastian, just returned from his two years' travel. He next referred retrospectively to the special session held by the Society on the occasion of the Congress of German Anthropologists in Berlin on the 6th of August, and also to the public reception given to Baron von Nordenskiöld at the Town-hall, in the presence of a brilliant assembly. About the same time the delegates of the

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* *Ante*, p. 766.

Geographical Society met in Berlin in order to receive the report of the results obtained during the past year by the German African Society, in connection with the exploration of Central Africa, and to consult on the steps to be taken next. The frequently discussed project of the union of all geographical societies in Germany—first suggested two years ago on the occasion of the fiftieth anniversary of the Society—gave rise to a lively debate, but owing to a considerable divergence of opinion amongst the assembled delegates, it was decided that this project should be abandoned, and that in its place a general congress of geographers should be called together annually, so as to afford at least a formal representation of the common interests of the various societies. The next meeting was appointed to take place in Berlin during Whitsuntide week, 1881.—The President next communicated to the meeting the latest reports received from African travellers. After alluding to the sad fate which had overtaken the two English explorers, Mr. Carter and Mr. Cadenhead, he read out the last letters which had come to hand from the German expedition in East Africa, sent out under the command of Captain von Schöler. The latest news was dated from Muhatta, the 3rd September, where the explorers had arrived after a march of about thirty days, and whence they proposed to start next for Tabora. Fever, dysentery, and the desertion of porters interfered as usual with the progress of the expedition, and the insecurity of the roads, due to the predatory attacks of the chief Mirambo, necessitated the greatest precaution. It was very doubtful whether the troops despatched by the Sultan of Zanzibar for the protection of the expedition would be able to restore order.—The most gratifying news has come to hand from Dr. Lenz, who, as previously reported, had succeeded in safely crossing the Atlas Range, and had reached the southern border of the Hammada on his way to Timbuctu. The few lines which the traveller forwarded from Tenduf, twenty days' march from Timbuctu, by way of Mogador, and addressed to the Society under date of May 7th, were as follows:—"I have arrived safely at Tenduf, Arab-Kabyl Tazzerkant, on the southern border of the Hammada, and to-morrow I shall start again. I have secured for the sum of 600 francs a guide to Arauan, who knows all the by-paths and more remote wells. Towards the end of May I expect to be in Arauan, distant only five days' journey from Timbuctu. How from thence I shall reach the Senegal, I do not yet know. I shall probably ascend the Niger for some distance, probably to near Segu, and thence endeavour to reach overland the nearest French fort on the Senegal." Just previous to the meeting, a letter had been received from the commercial firm of Hässner and Joachimson of Tangier, announcing the safe arrival of Dr. Lenz in Timbuctu. This news was brought to Mogador on the 14th September by the Arab Hadj Mohammed, who resides at Tenduf, and it was no doubt correct. Thus Dr. Lenz seemed to have happily escaped the treacherous pursuit of Sidi Hussein Ben Hedjam, who had summoned the various sheiks to murder the traveller as soon as he should enter their territories.—M. Flegel, who two years ago explored the course of the Benue, and who is about to visit again the regions of the Niger and Benue, had forwarded a series of meteorological observations from Lukoja. The traveller proposes to direct his steps towards Sokoto, but his further plans have not yet assumed a definite shape.—It was further announced that Dr. Rohlfs had already arrived in Egypt, whence, in conjunction with Dr. Stecker, he will start for Abyssinia.—Professor Dr. Credner, of Leipzig, then addressed the meeting on the subject of traces of glaciation in North Germany during the Glacial Epoch, enumerating the older and the more recent theories regarding the origin of the North German diluvial deposits.—In conclusion, Professor Dr. Bastian gave a sketch of his journey through Persia, India, Assam, the Indian Archipelago, New Zealand, and the Sandwich Islands, with especial reference to his ethnographic researches.

——— November 7th, 1880: Dr. NACHTIGAL, President, in the Chair.— the re-election of the Council, the President communicated to the me extracts from recent correspondence. Amongst these there was a letter fron Imperial German Consul Brauer at Mogador, confirming the already received of the safe arrival of Dr. Oscar Lenz in Timbuctu, where the latter had with a friendly reception on the part of the natives. Two members of his escort, who, on the way between Arauan and Timbuctu, had been sent back to after a lost package, were missing. The traveller hopes to be able to retu Europe in the course of this winter, *viâ* St. Louis, Senegal.—A letter had read from Major v. Mechow, who, eighteen months ago, had commenced, unde auspices of the German Government, a journey of exploration in Angola, in whi announces that, with his two European travelling-companions, he had left Ma on the 12th of June, and had arrived on the banks of the Quango on the 19th at a spot below the great waterfalls, to which no European had before been al penetrate. The road led through the territories of the Gingo, Congo, and tribes, the latter dwelling near the falls of the Quango. Although the expe was everywhere well received by the negroes, yet the hilly character of the cou with its countless deeply carved valleys, offered many obstacles to the transp the goods and of the composite boat. For instance, the Cambo, a tributary o Quango, which it joins between the two waterfalls, had to be crossed four times. camp of the travellers, at the time of the despatch of the letter, was pitched the falls, the more southern of which, called by the natives "Succambunda," bears the name of the "Emperor William Falls," while the northern one, "Gombe," has been renamed the "Emperor Francis Joseph Fall." The tra intends to descend the Quango, which here is already very broad, in his boat as its junction with the Congo, and then to return. Everywhere the height the sea-level was determined, and astronomical observations taken.—It was annou that Messrs. Rohlfs and Stecker had sailed from Suez for Massaua in order to co to the ruler of Abyssinia the letters from the German Emperor. Thence Dr. R will return in about three or four months, while Dr. Stecker will proceed e south or west according to directions to be forwarded to him.—The President announced that Messrs. Pogge and Wissman intend to sail in a few days for Ar at the expense of the German African Society, in order to penetrate into the kingd the Muata Yanvo, whom, as is well known, Dr. Pogge already visited in the year In the Mussumba of Muata Yanvo Dr. Pogge intends to establish a station, his companion will devote his time to topographic surveys.—Mr. Niederlein addressed the meeting on the scientific results of the Argentine expedition t Rio Negro in Patagonia, which he joined in the capacity of botanist; and Dr. tigal, in conclusion, spoke on the ethnological characteristics of the Tubu Karuri, as well as of the more important African races in general.

Imperial Geographical Society of St. Petersburg.—October 20th, 18 M. Sreznefsky gave an account of the scientific expeditions undertaken b Society. Two of these have been occupied in the exploration of Central Asia the expeditions of Colonel Prejevalsky and M. Potanine. M. Maief and Guédroitch were intrusted with the study of Bokhara and Khiva, while MM. khof and Mérejkofsky have been respectively engaged in exploring the Ural an Crimea. The letters received from Colonel Prejevalsky and referred to b Sreznefsky, have already been dealt with in our September and November numb

The object of the second expedition has, unfortunately, not been entirely atta

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* *Ante*, pp. 566, 697. A telegram, dated November 1st, has since been received Kiachta, announcing that Colonel Prejevalsky will arrive at St. Petersburg in Ja next.

M. Potanine, after spending the winter of 1879–80 at Irkutsk, wished to traverse South-western Mongolia, and continue his explorations there, but political events and the disturbed state of the Chinese frontier prevented him from so doing, and he was only able to make a short journey in the region of Darbut during the month of May. Finding it impossible to continue his expedition, M. Potanine returned to St. Petersburg, and he is now engaged in drawing up an account of his work.—Prince Guédroitch, a distinguished geologist, was sent during the past year to the Uzboi, and M. Maief to the mouths of the Amu-Daria, the former devoting the summer to geological observations, while the latter applied himself to the study of the Amu. M. Guédroitch observed a remarkable lowering of the water-level in certain affluents of the river, and a perceptible rise in others, among which the Kuvan-daria is the most noteworthy. Speaking generally, M. Guédroitch made a minute and detailed study of the delta of the Amu-Daria; and, among others, he explored the Sary-Kamysh basin, and he declares that there are no indications there to support the assertion that the Amu-Daria ever flowed through it; he thinks that the line of union between the Aral and the Caspian seas will be found south of Sary-Kamysh. Early in June, M. Maief proceeded to Karshi, and thence to Shir-Abad, Kélif, Kerky, Burdalyk, and Charjui; returning to Korshky, he pursued his journey to Bokhara, and to Samarkand. At the present time M. Maief is engaged in completing an important work on the Khanate of Bokhara, which will treat of all the leading questions affecting the social and economic life of the country; it will contain a topographical map of the regions traversed by the expedition, including the little-known valley of Kafir-nihan. M. Sreznefsky briefly adverted to M. Mushketof's exploration of the Zarafshan Glacier,* and afterwards referred to M. Mérejkofsky's two journeys, undertaken chiefly with the view of studying the prehistoric anthropology of the Crimea, in the course of which he made some interesting discoveries. M. Malakhof's expedition in the Ural also had important results in connection with geodesy and anthropology.—It was announced that M. Jurgens, lieutenant in the pilot service, had been appointed chief of the Russian polar station, which is to be formed in pursuance of the recommendations of the Hamburg Conference.†

Geographical Society of Lyons.—October 21st, 1880.—On the resumption of the meetings of this Society, some vacancies in the Committee were filled up, and the Chairman then referred to the Congresses held at Nancy and Rheims, in the month of August, of which the Secretary would present a report at a future meeting. It was announced that, in accordance with a resolution of the former Congress, all the geographical societies would hold a meeting at Lyons during the vacation of next year, and a hope was expressed that the members of the Society would do their utmost to make it successful. It was further stated that the Alpine Club of Lyons had been invited to take part in the organisation of the Congress. One of the subjects to be considered by it would be the establishment of a prize to be awarded every five years, in the name of all the geographical societies of France, for the encouragement of geographical knowledge.—After a recapitulation by the Secretary of recent geographical news, M. Delocre delivered an impromptu address on the subject of the railway now in course of construction between Firminy and Annonay, and, in consequence of the interest taken in it, his communication would be published in an early number of the Society's 'Bulletin.'—It was announced that the public monthly meetings would recommence for the session on November 21st, and that the annual general meeting would be held in the month of December.

Geographical Society of Cairo.—October 22nd, 1880: General STONE-PACHA, President, in the Chair.—The Society resumed its meetings after the vacation, and

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* See p. 765.

† Vol. i. p. 738.

a report,* by Colonel Graves, was read on his expedition to Cape Guardaf
neighbourhood of which the Egyptian Government, in 1878, contemplated e
ing a lighthouse, in consequence of the numerous shipwrecks occurrin
Accordingly, an expedition, consisting of several staff officers, under the c
of Colonel Graves, visited the Somâli coast, and made a detailed examin
various places beyond the Cape, with a view to the choice of the most suit
for a lighthouse. Colonel Graves' report, which was illustrated by maps, &
during the expedition, entered into full and minute particulars of the work
his party. After having described the courses followed by vessels on the
west of the Island of Socotra, and having pointed out the seasons whe
might be apprehended, Colonel Graves, in his report, arrived at the conclu
the mouth of the Wadi Rohun was the most suitable spot for the propos
house. The reading of this report and the exhibition of the maps were, w
stand, authorised by the Ministers of War and Foreign Affairs. The archiv
General Staff contain much valuable cartographical and other material, an
be regretted that the Egyptian Government does not allow more of the non-
results of its numerous expeditions to be made public.

NEW BOOKS.

(By E. C. Rye, *Librarian* R.G.S.)

EUROPE.

Rath, G. vom.—Siebenbürgen. Reisebeobachtungen und Studien. He
(Carl Winter): 1880, 12mo., pp. 190. (*Williams & Norgate:* price 2*s*.)

Chiefly of historical and linguistical interest, but containing some
the physical geography of the Southern Carpathians.

Seebohm, Henry.—Siberia in Europe: a Visit to the Valley of the Petc
North-east Russia; with descriptions of the Natural History, Migration o
&c. London (Murray): 1880, cr. 8vo., pp. 311, map, illustrations. Price

Mr. Seebohm, already known to geographers by his journeys to the
Yenisei, recorded in vol. xxii. of our 'Proceedings,' here gives the ornith
episodes of a trip in 1875 across North-eastern Russia from Archangel
Petchora River at Ust Zylma, and thence down the river to the Arctic
Some notes on the Samoyedes, and the record of general incidents of t
this comparatively little known region, add to the special value of thi
whose author's habit of minute investigation causes him to notice many
ing details of the physical aspects of the country.

Tomaschek, Wilhelm.—Die vor-slawische Topographie der Bosna, Herze
Crna-Gora, und der angrenzenden Gebiete. Wien (Zamarski): 1880, 8vo.,

An analysis of the historical Dalmatian itineraries and militar
(extracted from the 'Mittheilungen' of the Vienna Geographical Societ

ASIA.

Bird, Isabella L.—Unbeaten Tracks in Japan: an account of travels
Interior, including visits to the Aborigines of Yezo and the shrines of Ni
Isé. London (Murray): 1880, 2 vols., cr. 8vo., pp. 398 and 383, map,
tions. Price 1*l*. 4*s*.

After describing her experiences at Tokio, Miss Bird gives an accou
interior of Nippon, which she crossed *viâ* Nikko to Niigata, thence tr

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* We have already (*ante*, p. 373) given a full summary of that portion of
Graves' report, which deals with the interior of Somâli-land.

northwards more or less along the west coast to Aomori, after a visit to Yamagata and Shinjo. From the latter interior town, her route was by the head waters of the Omono to Kubota, on the coast, from which, after staying at Odaté, she reached the Tsugaru Strait by the pass of Yadaté. Much of her journey here was through wild country of which no prior authentic details exist; and the difficulties of identifying localities are considerably increased by the usual native habit of giving different names to the same river in various parts of its course. The political, social, and moral state of the natives of North Japan received much attention from Miss Bird, whose sex and solitary method of travelling availed her considerably in the effort to arrive at a just appreciation of their condition.

The second volume contains her experiences in Yezo, among the "Hairy Ainos." After crossing the strait and visiting Hakodaté, she travelled round Volcano Bay to Biratori, an Aino settlement in the southern interior, where she made some stay with the natives, of whose ethnological peculiarities she gives a very interesting account, finding among them many unsuspected good qualities, though agreeing with the opinion that they are as irreclaimable as the wildest nomads.

Some lengthy notes on Tokio and on Japanese public affairs, itineraries, an Aino vocabulary, &c., conclude this work, which is likely to impart a better knowledge of the actual condition of the empire and such of its inhabitants as were visited by the authoress, than could be obtained from more pretentious books.

Burbidge, F. W.—The Gardens of the Sun; or, a Naturalist's Journal on the Mountains and in the Forests and Swamps of Borneo and the Sulu Archipelago. London (Murray): 1880, cr. 8vo., pp. 364, illustrations. Price 14*s.*

Chiefly records of the author's botanical and ornithological experiences near Labuan and Kina Balu. Some notes on tropical travel will be found useful, in addition to the scattered observations on the fauna and flora and the habits of the natives.

Rajputana.—The Rajputana Gazetteer. Calcutta (Office of Government Printing): 1879, 2 vols. 8vo., pp. 284 and 292.

After a general description and account of the physical configuration of the country, its geology, mountain, river, and lake systems, climate and forests are separately discussed, as well as its historical, political, and industrial aspects. The separate States of Banswara, Kusalgarh, Bhartpur, Bikanir, Bundi, Dholpur, Dungarpur, Ajmer-Merwara (by J. D. La Touche), Jaipur, Jesalmer, Jhaláwár, Jodhpur, and Mallâni, are then treated separately in detail.

Reed, Sir Edward J.—Japan: its History, Traditions, and Religions, with the narrative of a visit in 1879. London (Murray): 1880, 2 vols. 8vo., pp. 365 and 356, pls., map. Price 1*l.* 8*s.*

The author visited Japan early in January 1879, and appears to have spent some three months in the islands, enjoying official opportunities of visiting objects of interest. After a month in the eastern capital, he went to the Inland Sea and Nagasaki, Osaka, Nara, Kioto, Isé, Nagoya, Shidzuoka, Fuji-Yama, and the Hakoné mountains. The first volume is purely historical and compiled; in the second, besides incidents of travel and descriptions of locality, will be found special chapters on the language and literature, proverbs and phrases, drawing and painting of the Japanese. Some of the engravings are by native artists, others from photographs, or from drawings by the author's son, many of which are of considerable merit. A list of Japanese emperors and of the year-periods is given.

Tomaschek, Wilhelm.—Centralasiatische Studien. II. Die Pamir-Dialekte. Wien (Carl Gerold's Sohn): 1880, 8vo., pp. 168.

Extracted from the 'Sitzungsberichte' of the Vienna Academy of Sciences, vol. xcvi.

AFRICA.

Burdo, A.—A trip up the Niger and Benueh. Translated by Mrs. George S
London (Bentley): 1880, 8vo., illustrations. Price 10*s*. 6*d*.

The original work has already been noticed in our 'Proceedings.'

Egypt.—Das alte-, Christiche-, und heutige Ægypten, geschildert von
Budapest (Athenæum Gesellschaft): 1880, 8vo., pp. 781, map. (*Willi*
Norgate: price 8*s*.)

Of historical and statistical interest only.

Leclercq, J.—Voyage aux Iles Fortunées, Le Pic de Ténériffe, et les Ca
Paris (Plon): 1880, 16mo., pp. 237. (*Williams & Norgate:* price 2*s*. 6*d*.)

A short bibliographical list of French and Spanish authorities is, pe
the most important part of this record of impressions of travel in well-l
islands.

Mathews, W.—The Flora of Algeria, considered in relation to the Physical E
of the Mediterranean Region, and supposed submergence of the Sahara. L
(Stanford): 1880, 8vo., pp. 55, map. Price 2*s*. 6*d*.

Originally published in the 'Transactions' of the Birmingham Philoso
Society, this treatise of the former President of our Alpine Club will con
itself to all interested in the curious questions arising with regard t
physical geography of Northern Africa, from its careful analysis of the v
theories adduced on the formation of the Sahara, and its reference t
evidence afforded by the kindred sciences of botany and conchology.
author sums up by disbelieving any submergence of the great desert of
Tertiary date. The map shows the submarine contours of the shores of E
North Africa, and part of Asia.

Watson, Robert Spence.—A Visit to Wazan, the Sacred City of Mo
London (Macmillan): 1880, 8vo., pp. 328, map, illustrations. Price 10*s*. 6*d*

The author visited Morocco early in October 1879; from Tangier he s
south to Mazorah, then reaching Arzila and Larache on the west coas
arriving at Wazan by the Loukkos past Al Kasar. The return was made t
interior to Fonduk, from which place Mr. Watson travelled east to Tetuan
chief interest in the account is naturally the description of the Holy City,
before entered by any European except Dr. G. Rohlfs. The author disclaim
pretentions to geographical science, and in fact succeeded in his purpose s
fortuitously; he found much kindness among the southern Moors. A
Index materially adds to the value of this interesting volume.

AMERICA.

Becher, H. C.—A Trip to Mexico, being Notes of a Journey from Lake I
Lake Tezcuco and back, with an Appendix, containing and being a paper
the ancient nations and races who inhabited Mexico before and at the time
Spanish Conquest, and the ancient stone and other structures and ruins of a
Cities found there. Toronto (Willing and Williamson): 1880, squ. 8vo., p
photographs.

The scope of this work is amply shown by its title; independently
information bearing upon the present actual condition of Mexico containe
it shows many of the physical features of that Republic by original photog
some of the illustrations, however, being merely photographed from pul
works or prints. It may here be mentioned that a cast model of the
Calendar Stone, given as the frontispiece, and another of the Sacrificial
are in the Library of this Society, presented by C. H. Wallroth, Esq
brought them from Mexico.

Gallenga, A.—South America. London (Chapman and Hall): 1880, 8vo., pp. 400, maps. Price 14*s.*

The author's experiences in Peru, Chili, the Argentine Republic, Paraguay, and Brazil, giving a picture of life as it now is, have here been collected from the 'Times' newspaper, in which they originally appeared.

AUSTRALASIA.

D'Albertis, L. M.—New Guinea: What I did, and what I saw. London (Sampson Low & Co.): 1880, 2 vols. 8vo, pp. 830. Price 2*l.* 2*s.*

Details the author's experiences as a natural-history collector in the Arfak Mountains and Fly River, of which the geographical aspects have been already discussed in our own 'Proceedings,' and in the Italian Journal 'Cosmos.'

GENERAL.

Grisebach, A.—Gesammelte Abhandlungen und kleinere Schriften zur Pflanzengeographie. Leipzig (Engelmann): 1880, 8vo., pp. 628, portrait. (*Williams & Norgate:* price 1*l.*)

Almost exclusively devoted to the geographical aspect of Botany, with accounts of the progress of knowledge regarding distribution arranged by countries, 1866–76. The want of an index materially detracts from the value of this collection for referential purposes.

Klein, H. J.—Physische Geographie. Nach dem gegenwärtigen Standpunkte der Wissenschaft dargestellt. Stuttgart (Spemann): 1880, 8vo., pp. 559, illustrations. (*Williams & Norgate:* price 13*s.* 6*d.*)

This addition to the already numerous list of treatises on Physical Geography is chiefly remarkable for the great number of its illustrations, many of which are of superior execution.

Richardson, John.—(Dr. Wm. Smith's English Course). A smaller Manual of Modern Geography, Physical and Political. London (Murray): 1880, 12mo., pp. 283. Price 2*s.* 6*d.*

For the use of junior classes, to whom the author's 'School Manual of Modern Geography' would be unsuited.

Stier, H. C. G.—Vlämisches Tagebuch über Vasco da Gama's zweite Reise, 1502–1503. Braunschweig (Schwetschke): 1880, 12mo., pp. 42. (*Williams & Norgate:* price 1*s.* 6*d.*)

A reprint of the Dutch text, with German translation, of the anonymous description of a voyage from Lisbon to "Calcoen" (Calicut), identified with the second voyage of Vasco da Gama in 1874 by Mr. J. P. Berjeau, who published a reproduction of the text of the copy in the British Museum and an English translation in 1874 (Pickering). Dr. Stier's copy was accidentally found in Birmingham: he appears to be unaware of Mr. Berjeau's work. Some notes at the end are of interest.

NEW MAPS.

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ARCTIC REGIONS.

Petermann's 'Geographische Mittheilungen.'—Provisorische Karte von Lieutenant Schwatka's Expedition zur Aufsuchung der Reste von Sir John Franklin's Expedition auf King William Land 1879 and 1880. Nach H. W. Klutschak's Karte. Scale 1:3,500,000 or 47·6 geographical miles to an inch. Petermann's 'Geographische Mittheilungen,' Jahrgang 1830, Tafel 20. Justus Perthes, Gotha. (*Dulau.*)

EUROPE.

Kiepert, H.—Neue General-Karte der Unter-Donau- und Balkan-Länder m Grenzen von Serbien, Bulgarien und Ost-Rumelien nach den im Jahre ausgeführten officiellen Aufnahmen bearbeitet von Heinrich Kiepert. 1 : 1,500,000 or 20·4 geographical miles to an inch. Dietrich Reimer, I Librairie Lorentz & Keil, Grand' Rue de Péra 487, Constantinople, 1880. Pr (*Stanford.*)

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Wichmann, E. H.—Map of Great Britain and Ireland, designed by E. H. V mann. Scale 1 : 910,000 or 12·4 geographical miles to an inch. Printe Mühlmeister, Johler, and Brauns, Hamburg. 1880. 2 sheets. Price (*Williams and Norgate.*)

AFRICA.

Wyld, J.—Map of Eastern South Africa from the Limpopo River to Algoa embracing the Transvaal, Orange Free State, Natal, Zulu and Griqua-Land W showing the British Settlements and Native Locations. Scale 1 : 742,400 or geographical miles to an inch. J. Wyld, London. 1880.

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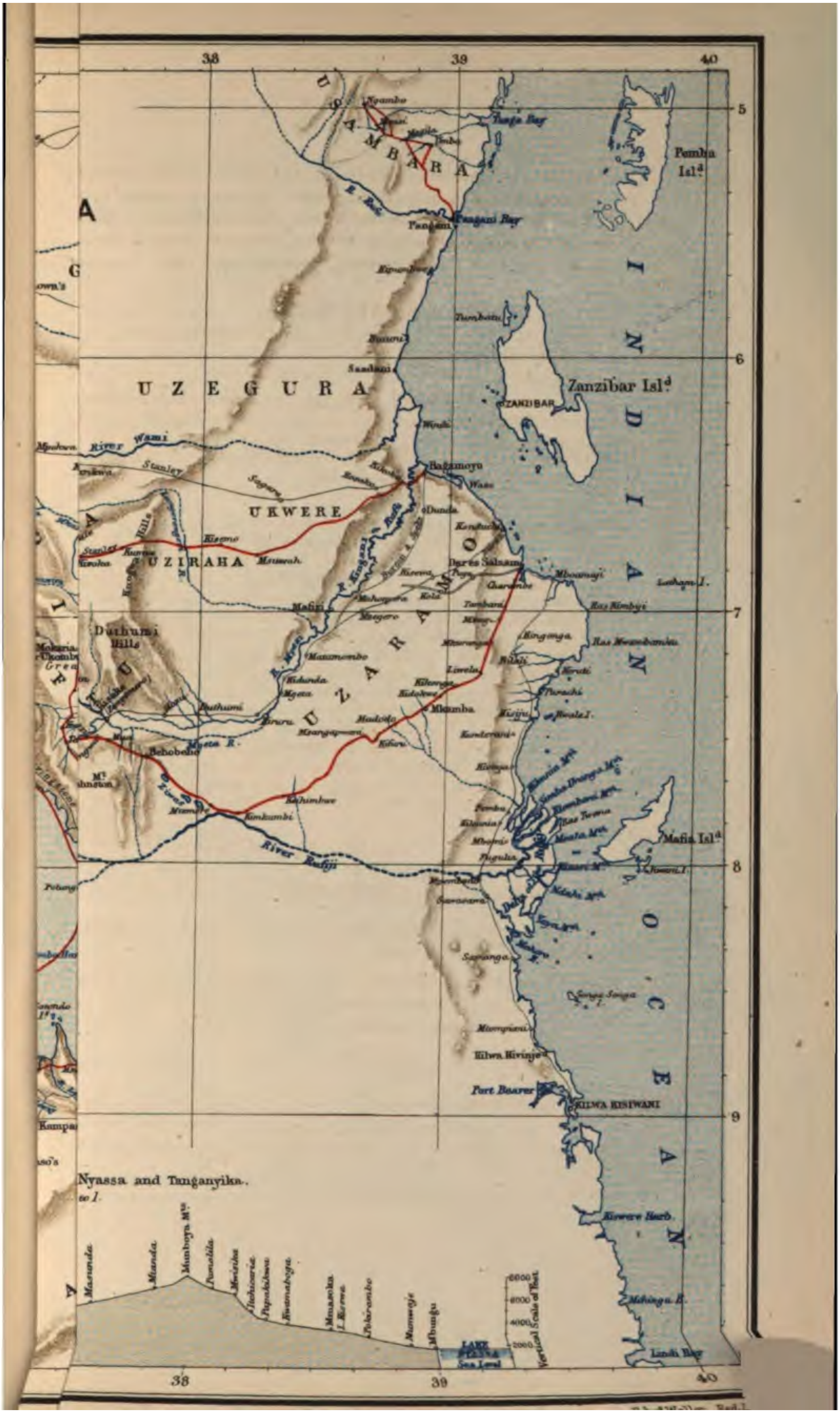
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* The proportion of the vertical to the horizontal scale in the section given on this map is 17 to 1, instead of 206 to 1 as stated.

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LONDON
PRINTED BY WILLIAM CLOWES AND SONS, LIMITED, STAMFORD STREET
AND CHARING CROSS.